No. 490.—VOL. XVIII.] SATURDAY, MAY 31, 1851. [TWO NUMBERS, 1s.

THE GREAT EXHIBITION.

COTTON MANUFACTURES.

UNINTERESTING as many persons—and those, too, best acquainted with the routine of the cotton trade—may think an exhibition of the various productions of skill and ingenuity in this department of our national industry, yet he would be a very superficial thinker who merely looked at the question from this point of view. The immense advantages accruing to this country from the position to which the cotton manufactures have progressed—the employment it gives to so many hundred thousand of our population—the comfort diffused by its agency throughout the whole habitable globe—renders it an object of more than ordinary interest since the commerce of which it usually forms the first staple in its many Protæan forms is generally the harbinger of that colonisation to which all reflective minds look as the great work of the men of the present day.

In our former notice of the leading features of the examples of cotton trade displayed in the Great Exhibition, attention was called to the fact, that the immense advantages we possessed in the rapid and economical manufacture of this material were such as to be well worthy of attentive consideration, and that it must be remembered that every ounce of the material to be worked into the various forms required by our commerce had to be brought across the Atlantic, manufactured by the various processes of spinning, weaving, printing, and dyeing, and in many instances taken back to the very place whence it came. In our notice of the iron manufactures, an allusion was made to the fact that the mineral treasures of this country were the true basis of our national industry, wealth, and prosperity; and certainly nothing proves this more than the cotton trade. For, though the enormous development given to the mechanical genius of the country by the inventions of Watt and Arkwright, and the facilities for obtaining and readily working the material by which that mechanical genius has been realised—from the ponderous steam-engine and hydraulic press on the one hand, to the most delicate spinning machinery on the other—we have been enabled to take a position as a manufacturing nation which is being daily and hourly enhanced by the wide extension given to our commerce through the cotton trade as the means of supplying the second great want of man, clothing; and that, too, in such a manner as to be eminently diffusive, since the cost is reduced to the minimum by the mechanical agencies so constantly at work, whilst the maximum power of production is obtained by those improvements in machinery, and the discoveries of science which it appears to be the peculiar mission of this country to promote. Not that we believe there is nothing worth living for except the production of an unlimited quantity of calico, which Sidney Smith sarcastically declared to be the opinion of the great body of our cotton manufacturers; but because there is inherently attached to the commerce connected therewith an opportunity for the diffusion of the blessings of civilisation, which has been felt wherever the Saxon race has found its way, and will continue to

1.—LEISTLER'S SIDEBOARD.

be felt in a greater degree in proportion as men see the real purposes of commercial unity and freedom, and understand the power they possess for good or for evil, even as they use the opportunities given to them.

We have, then, in the cotton manufacture, a double power for good: first, in the employment of our own population; and, secondly, in the promotion of that social intercourse of nations to which hopeful men have looked in all ages; and this, too, in an increased degree, as compared with any other of our manufactures, since we are compelled to go to the most distant colonies to obtain the raw material, in the first instance, and hence have a double opportunity, first in buying, and afterwards in selling. Thus, the question now so much agitated in the manufacturing districts of Lancashire, as to the importance of opening new fields for the cultivation of cotton, becomes also a question for the philanthropist, as to the good to arise to the great cause of civilisation out of the variation of the sources from whence we are in future to draw our supply of raw material for the purpose of employing our population and the enormous amount of machinery which we have constructed at such an immense outlay of time, talent, and money. That the southern states of America cannot continue to supply our wants as hitherto with any degree of certainty, seems a settled question to those who best understand the peculiar position of the United States, and at the same time take into consideration the requirements of our manufacturers, apart from the fact that it would be unwise to continue to suffer the immense population of our cotton manufacturing districts to depend upon an institution so uncertain in its character as slavery certainly is; for any movement which might take place in the slave states of the American Union, by which its present servile population should temporarily suspend their industrial pursuits as cultivators of cotton, would inevitably tell with frightful effect upon the industry of the north of England and of Scotland in the suspension of trade for want of raw material. This question, therefore, of the source whence our future supply of cotton is to come is of infinitely more importance in a national and social point of view than at first sight appears; for it is a fact which cannot be too often brought forward for the consideration of "the powers that be," both home and colonial, that the great staple trade of probably one-third of the population of England and Scotland is mainly dependent, at the present time, for employment and almost for existence, upon the worst institution of modern times, the slavery of the southern states of America; and, without seeking to become alarmists, it would be a dereliction of duty not to take an opportunity like the present to endeavour to bring this fact more prominently forward than it has been hitherto. With our East India possessions, with Natal and many of our colonies, particularly some of the West India islands, where cotton is indigenous to the soil, but where it has been neglected for far less profitable and important matters, we may, if those who guide our affairs think fit, do great things towards supplying our own wants; and, whilst contriving to keep up our trade with the United States, to be less dependent upon them, and enable them to supply their own wants in a more satisfactory manner than at present.

It would be quite out of place here to enter into the history of the cotton plant, its growth or manufacture; but to those sufficiently interested in the question, we would recommend the careful consideration of the cotton machinery at work in the Exhibition. Here may be traced the progress of the soft down-like substance, from the pod of this tropical plant, whose flowers are so ornamental when seen in all their fulness and beauty, until it becomes wrought into lace, as a means of adornment, or into cloth of varied texture and quality for the pressing requirements of man; and all this, too, by the aid of machinery driven by that worker of modern miracles—steam. Here, whilst the visitor goes amidst the rush of spindles and the flying of shuttles, and watches the almost intelligent action of the Jacquard in the production of artistic forms, in lace and other fabrics, he cannot fail but learn something of that mighty system which has grown up during the last sixty or seventy years, which has brought comfort and independence to so many thousand homes, and developed the genius of so many men who might have died in obscurity but for the field presented therein for the exercise of their talent, their energy, and their usefulness.

Tracing up the process through its various complications of cleaning, carding, spinning, and weaving, in the machinery courts, the visitor who desires to see the full results arrived at in our cotton manufacture, may find them fully exemplified in a variety of forms in that portion of the British side of the Building set apart for this class of contributions, which will be found on the left of the western entrance between the Central Avenue and the Carriage Court.

Under the heads of the respective towns on the British side, and of countries on the Foreign side, we purpose giving a sketch of the most noticeable features of the illustration of the cotton manufactures contributed to the Exhibition, and in courtesy commence with the metropolis of the cotton trade,

MANCHESTER.

Whether it was from a full realisation of the proverb, that "familiarity begets contempt," that the men of Manchester have done so little for the fair representation of their staple trade, believing, as they might have done, that a matter so common to themselves would be equally well known to others, or from their apathy as to the real purposes of the Exhibition, will be difficult to ascertain; but this is certain, that had Manchester consulted its own honour, and acted half as wisely as it usually does in economic matters, an infinitely better display would have been the result. Not that it was desirable to see whole acres of calico; but a more systematised representation of the state of its trade in this middle year of the nineteenth century would have been as creditable to its sagacity as the very desultory manner in which its examples are exhibited is discreditable to it as the manufacturing metropolis of Great Britain. Of course these remarks apply to the display as a whole and as representing Manchester, and not to the individual exhibitors, inasmuch as each has made his own arrangements as complete as the circumstances of the case would permit. Quoting, as we have already done, the display of Messrs. Thomas Houldsworth and Co., Mr. Bazley, and Messrs. Glover and Dunn, as a fair exemplification of certain branches of the cotton trade, and the processes connected therewith, there can be no doubt that each of these contributions is fully illustrative of all the points undertaken for exemplification, and as such are worthy of more attention than the mode of their exposition is calculated to ensure for them.

In our previous glances at the general features of the Exhibition, the examples of fine spinning exhibited by Mr. Bazley (53) and Messrs. Houldsworth (54) were noticed, and certainly, after the successful effort of the former, in producing so great a number as 1000 in competition with the 900 of the latter, the limit appeared to have been reached. We find, however, that calculations as to the limits of mechanical skill and ingenuity are in this case, as in many others, anything but certainties, since in a few days after the last notice in which we endeavoured to do justice to Mr. Bazley, a specimen made its appearance in Messrs. Houldsworth's glass case numbered 1400, and subsequently examples of 1800 s and 2150 s have been added; and we hear rumours from Manchester, where the matter has excited a great deal of attention, that even this latter is to be exceeded, and that after spinning cotton so fine as to give 2026 miles to the pound weight, the limit is not yet determined. It must, however, be still borne in mind that all this is more curious than useful, since the 700 s appear the limit of utility. Comparing the specimens, little apparent difference can be detected. The specimen of 1400 s by Messrs. Houldsworth is by no means so clear and even as that of the 1000 s by Mr. Bazley. The curious visitor may desire to know how this question of length and fineness is ascertained with such certainty as to enable the manufacturer to state it in so positive a manner. This, however, is easily answered. A certain length of fibre being weighed in a delicately constructed apparatus, the relative proportion of the weight to the length gives the basis for the calculation. Within the last few days another addition has been made to each of these contributions, and Messrs. Houldsworth now display 800 s. in skein and bobbin, thus showing, so far at least, its practical character; Mr. Bazley exhibiting an additional specimen of 2070 s.

It is to be regretted that Mr. Bazley's illustrations of the transition progress of the manufacture of cotton from the raw material to the finished state as displayed in the fine and coarse departments of the trade, are not spread over a larger space, since they ought to have been arranged in a glass case at least twice the size of the one in which they are exhibited, in order to give them full effect; the specimens being so much crowded together as to render it difficult, except to the initiated, to distinctly separate the specimens in one compartment from the other.

A specimen of New Orleans cotton commences the series of examples illustrative of the coarse manufacture. A specimen of the same is then shown in the state of first carding, and finished carding. Then comes a specimen of drawing-frame sliver; and, following that, three examples of roving—first, second, and finished. Mule yarn, throstle twist, shuttle, mule yarn, stocking yarn, and threefold sewing thread follow, in various numbers; and then specimens of white and finished calico, and brown and printed fustian complete the series of examples so far as the coarser kind of cotton manufacture is concerned.

In the examples of the fine trade, the series commences with Sea Island cotton, a specimen cleaned, then in two states of carding, drawing-frame sliver, and the successive rovings, examples of mule yarn to 600 s; crape yarn, two-cord-lace thread; three, six, and nine-cord skeining thread; three specimens of white and printed muslins of very fine texture; figured muslin, white and printed lace, and figured lace.

With the key thus furnished, the visitor will at once see the interest and value of Mr. Bazley's contribution, inasmuch as it leads him up from the raw material to the point at which the contributions around him start into existence; and, when these are studied in connexion with the machinery, a very excellent idea of the cotton manufacture will be obtained. We must, however, repeat our regret that specimens so well selected and arranged for these purposes are not spread over a surface calculated to give more distinctness to each individual example.

As already noticed, Messrs. Glover and Dunn's contributions (50) follow up the illustration thus given by Mr. Bazley; and in another case they show a series of examples from the seed to the cloth. Power-loom calicoes of various qualities, grey and bleached; India shirtings, of which 5,000,000 yards were sent last year to Calcutta alone; jaconets for printing, and cambrics in a range of qualities; India twill and figured shirtings, complete; a series of examples of the staple of Lancashire, which, insignificant as they may appear to the casual observer, constitute in a large degree the basis of our national prosperity; and we cannot but regret that the Manchester Committee did not think it worth their while to place them before the visitors to the Exhibition in a more attractive form than it was reasonable to expect any individual would undertake to do, inasmuch as he could not, as in most other instances of tasteful and costly displays, expect to gain anything by his efforts. Hence, though the illustrations are certainly given, they are flung down upon a common counter in anything but an inviting form.

The other examples of cotton manufacture from Manchester are chiefly quiltings. The contribution of Messrs. J. Spencer and Son (52) consists of white and coloured woven waistcoatings figured in the loom, and bed quiltings, together with a new application of the fabric to the purpose of hangings for windows and beds—these being all very excellent examples of their class. The specimens of the same class exhibited by Mr. Jabez Johnson (48) are, however, to our mind, more especially adapted to show the excellence to which this kind of fabric has attained; and the large coloured toilet bed-cover, in which, as we are informed, 13,000 cards were used for the pattern, and in the manufacture of which the weaver makes 25,000 strokes of his shuttle, being a noticeable example alike for the design as for the execution. The toilet-covers and waistcoatings, even to the plain wove white diamond quilting, are excellent examples of their class.

Messrs. Major and Gill (49) exhibit a series of examples of double coutils and nankeens for ladies' stays, stitched during the process of weaving, by which the usual quiltings by the needle are produced at once, and a double cloth formed of a great variety of patterns. The advantage of this process lies in the fact that the cloth thus worked together is much stronger and more even than two pieces placed together and then stitched; whilst the cost of production is the same for the double cloth as the single, except in the comparatively small expense of the silk or cotton used in the stitching process.

Altogether, the examples from Manchester are good of their kind; and, though much more might have been done, both as regards extent and variety, it is quite certain that matters might have been much worse, except, perhaps, in the character of the arrangements, which are crude and unsatisfactory as a whole.

In connexion with cottons, but exhibited in Class 18 with the printed and dyed fabrics, are specimens of cotton cloth prepared by a process discovered by Mr. J. Mercer, of Accrington, and now patented by him. This, in all probability, will produce a great revolution in the cotton trade, not only as regards printed but plain goods. When noticing the printed fabrics we shall again have occasion to refer to this matter—our business now is with the plain cloths. By immersing the cloth in a chemical solution, Mr. Mercer adds one-sixth to its weight; and this weight, unlike the usual preparations for giving substance, or rather an appearance of substance cannot be washed out. It possesses the singular quality of shrinking a cloth to greater density; and an open material being manufactured, it is thus rendered equal to a closely woven cloth, both in appearance and in weight, and the material to which it has to be applied is spread over a larger surface for that purpose. This is, in all probability, one of most remarkable discoveries in the Exhibition.

BOLTON.

The illustration of the cotton manufacture originally intended to be made by the exhibitors from Bolton, has been injured in its completeness by the unfortunate destruction by fire of fourteen weeks' labour, just at the very period when the goods were about to be sent in; and, though every indulgence was offered, the exhibitors, Messrs. Joseph and Thomas Heaton, of Halliwell, were compelled to forego their intended display.

As quiltings constitute the staple trade of Bolton, the leading features of the exposition of its manufactures are in these fabrics. Messrs. Barlow, Goody, and Jones (35) exhibit figured quiltings for bed-covers, both white and coloured, as also figured vestings and welted quilts. Messrs. W. W. and J. Cook (38), brocaded small dress-pieces, plated quilting sheets, and brocaded satins—all of excellent make. Messrs. W. Martin and Son's (37) damask furniture dimity are also good examples of their class, and the design of one or two of the striped examples very excellent and appropriate. Messrs. Myerscough, Steel, and Co. (39) show some quiltings of good water, but very indifferent design. Mr. J. Sudworth's contribution of a woven bed quilt, as a specimen of a style of work now comparatively neglected for productions of a cheaper kind, is worthy of notice and examination as a meritorious production of its class. The pattern is produced by the weaver pulling up each individual thread which forms the figure on the surface—a tedious and lengthy process in elaborate designs. The result, however, is rich in effect, and highly characteristic of the purpose for which the article is intended to be used—a matter of no small importance in point of taste, but too frequently neglected.

LONDON.

Before proceeding further with our notices of the various manufacturing districts, it is desirable that we should call attention to the display made by the London houses, who, either as merchants or manufacturers, or, in some instances, as both, exhibit examples of their wares in the cotton trade. Messrs. Horrocks, Miller, and Co. (60), of Bread-street, Cheapside, and Preston, Lancashire, exhibit specimens of the long cloths and shirtings, for which, as a manufacturing house, they have been so long famous, having commenced manufacturing in 1791; and their fabrics are as well known in the most distant markets of the world as Temple-bar is to the most veritable Londoner. In muslins, Messrs. Mair, Son, and Co. (59), of Friday-street and Glasgow, exhibit very tasteful examples of window-curtains, figured in the loom. The one over the counter upon which the last-named contributions are arranged is an admirable example of great extent of pattern, and perfect execution, obtained at a reduced cost, through a new arrangement on the principle of the Jacquard loom, the process being patented. The pattern of this curtain is a bold and effective one, and though a severe taste in textile design will object, and rightly too, to the introduction of the vase containing the flowers, yet the whole arrangement is so massive and effective as to leave little to be desired—the drawing of the flowers and the border being excellent examples of the special adaptation of natural forms to mechanical exigences. We hope to give an Illustration of this specimen in an early Number. Messrs. Main also exhibit some plain muslin, manufactured by them, at Glasgow, from No. 540 s, cotton-yarn, spun by Messrs. Thos. Houldsworth and Co.. probably the finest ever used for such a purpose. The tamboured and embroidered muslin dresses are good examples of Scottish skill and industry.

Messrs. J. and A. Crocker's (6) specimens of harness woven curtains, arranged in a complete drapery as an example of window decoration, are very excellent. There are, however, some examples amongst the French specimens of the same class which remind us very strongly of these same curtains. Messrs. Bradbury, Greatorex, and Beale's (56) harness muslin window curtains, excellent as they may be in some points, are injured in point of taste by the introduction of representations of buildings, an anachronism in design which none but an unreflective purchaser could tolerate. An architectural erection, festooned as a window curtain, is a species of "castle building" of which the less we have, in future, the better. In one or two specimens exhibited by Messrs. Robert Johnson and Nephew (55) the same absurdity is to be found, whilst the broad effects of the curtain exhibited by this house of an adaptation of the palm and plantain trees show the true basis of design in this department, though we think it might be better used than in the specimens before us, creditable as they certainly are. The specimens of nainsook, book, tarlatan, and other muslins, exhibited by Messrs. Rogers and Co., of Watling-street (58), do not require anything more than a passing notice of their excellence in manufacture.

Apart from the metropolitan group, and on one of the counters projecting into the central avenue, Messrs. Robert Outram and Co. (62), of Watling-street, exhibit excellent samples of satin brocades and flush sprigged muslins. These fabrics are remarkable specimens of the beauty attainable in the cotton manufacture. The damask effects are charmingly wrought out, and the patterns at once tasteful and appropriate; and we believe they are *unique* in the Exhibition. Another isolated group in the Bolton division is the contribution of Messrs. Christy and Sons, of Fairfield Mills, near Manchester (44). The exhibitors call the fabric the "Royal Turkish Bath Towel," and the manufacture was suggested by specimens brought from the East by one of the firm, a mode of producing it by machinery having been discovered under Holt's patent. The fabric has a plush or looped face on both sides, and affords a great absorbing surface. Her Majesty has already supplied the Royal nursery with it, as the great softness of the cotton in this form adapts it peculiarly for young children. The linen nap or surface giving equal absorbency, and producing a sharp effect on the skin, whilst the cotton ground gives pliancy to the material, and at once takes up and retains the moisture; hence the estimation in which cotton has been so long held in the Eastern baths.

SEWING COTTONS.

Departing in this instance from our intended classification of terms, we desire to notice in a group the various contributions under this head, coming as they do from so many different districts. Probably the most complete display is that of Messrs. Jonas Brooks and Brothers, of Meltham Mills, Huddersfield (24). The glass case in which the specimens are exhibited contains examples of the various kinds of cotton threads in various numbers, from the raw material through the processes of rovings to throstle yarns on bobbins, mule yarns in cobb and hank, sewing threads in hank, grey and bleached; and then in various numbers of 2, 3, 4, 6, and 9; cord thread and crochet cotton wound on spools, as also examples of wire thread. The cotton thread of this house has long been well known for its excellence; and though others doubtlessly possess points for commendation which it would not interest our readers to enter into here, yet Messrs. Brooks' display appears to be the most complete and satisfactory as a whole.

The specimens exhibited by Mr. J. P. Clarke, with which also the progress of the manufacture of the patent metallic reels, from the rough hazel wood to the finished article is shown, are interesting; and near these are grouped those of Messrs. Evans and Co., of Derby, Messrs. Thackeray and Son, of Nottingham, and Mr. Harris and Messrs. Raworths, of Leicester; while Mr. J. W. Haythorn's contribution from Burton-on-Trent is also worthy of careful examination, containing as it does examples of thread for so many various purposes, such as sewing, knitting, glove, and hosiery making, lace, and ribbon manufacture. In this group, then, we have before us an important illustration of a department of our national industry in which we have so far stood unrivalled. The small wares of Messrs. Waters, of Manchester, are also worthy of examination, as they possess many points of excellence.

CARLISLE.

This ancient Border city has been long celebrated for its productions in certain departments of the cotton trade, and, as a matter of course, is represented on an occasion like this. Of the Carlisle chintzes we shall have occasion to speak when examining the printed fabrics; our business now is with the ginghams and other examples, of which to quote their names would rather puzzle than instruct; inasmuch as few people care much about Camperdowns or Coromandels, matallas, nicanees, or briolas, which may or may not possess merit and interest for the foreign or colonial buyer, and which it is very proper should be shown as examples of their peculiar class. Messrs. Peter Dixon and Sons make an extensive display in this department, and are supported therein by Messrs. Lowtham and Parker, and Messrs. Pearson and Co., the display of the latter being of the useful rather than the ornamental kind, the colourings and mixtures being all of a subdued, but, withal, clean-looking and pleasant tone. Mr. M'Gibbon, also of Carlisle, exhibits some very tasteful specimens of striped and checked ginghams, principally intended for the American market.

Whilst on the subject of ginghams, it is requisite to direct attention to the Irish specimens exhibited by Mr. J. O'Connell of South Main-street, Cork. In these we see examples of a manufacture for which "the beautiful city" was once famous, but which, from neglect, and the active competition of England, had gradually died away, until the few weavers who were left had almost forgotten their former skill in the misery and degradation to which they were reduced. A few spirited individuals have been labouring to revive the banished trade, and with considerable success, the specimens now exhibited being good examples of the resuscitated skill of the Cork weavers.

GLASGOW.

The metropolis of the west of Scotland has not failed to show specimens of the skill of her sons and daughters; and, though not such an one as certainly ought to have been made on this occasion by the manufacturing centre of North Britain, yet in many points there is much to commend, particularly in those departments of trade of which Glasgow is the commercial representative.

The sewed and tamboured muslins of Scotland are the means of employing many thousands of females in their own homes; and the importance of this trade in a social point of view is not, therefore, to be overlooked. We trust, however, to illustrate this more fully when treating of the sewed muslin trade of Ireland, and shall, therefore, confine our present notices to the productions of the loom as a primary point for illustration. In the display here made, harness muslin curtains, ginghams, and coloured muslin cravats, take the lead, and, indeed, form the great staple of the contributions.

Messrs. Patterson, Jamieson, and Co. (11) make a very tasteful display of cravats, dress goods, and light summer shawls; and the specimens shown by Messrs. James and Alexander Anderson (7) are also of very elegant character on close examination, the colours in the cravats being well chosen, and skilfully intermingled in the weaving. Messrs. David and John Anderson (16) also make a creditable display in chequered ginghams of various styles and qualities. In muslins, Messrs. Auld, Berrie, and Mathieson. show harness window-curtains, sacchinilla, book jaconet, and mull muslins; and Messrs. J. H. Young and Co. (12) also show largely, and in great variety, one or two of the curtains being very excellent in workmanship, and tasteful in design. We wish, however, that we could say the same of the whole of the Glasgow specimens in this department. Messrs. R. B. Symington and Co. (—) show one leno curtain amongst others, the design of which is composed of tropical plants and flowers, boldly and effectively arranged. We object, however, to the introduction of the tiger, even as a dead weight, at the bottom of the curtain; but, as a leaping ornament, it is quite out of place. Messrs. Letham, Blythe, and Letham (9), and Messrs. E. Henry and Co. (13), exhibit muslins and examples of tambour work and embroidery (to be noticed hereafter). And in the more useful and plainer departments, Messrs. M'Bride and Co. (6) display an excellent assortment of bird's-eye diaper and huckaback towelling, manufactured by power, as also table-cloths and tartans, the weft of which is prepared hemp, by Mr. E. Slack, of Renfrew. The dyed cotton yarns exhibited by Messrs. Oswald, Stevenson, and Co. (10) are interesting to the manufacturer, and are sent for the purpose of showing one of the leading features of the trade of Glasgow, in preparing material for final use in other places, both at home and abroad.

Before quitting the cotton department on the British side, it may be well to call attention to a novel application of calico, as exhibited in the metropolitan division, by Messrs Lincoln and Brenett (57). Its use for the body of hats is plainly shown, and its lightness and flexibility (two great qualities) acknowledged at once; but its application to the manufacture of furniture may be doubted for practical purposes, although, as a curiosity, it is worthy of attention.

FOREIGN COTTON MANUFACTURES.

The specimens of the position of our neighbours in this branch of industry are so scattered over the eastern portion of the Building, and appear together in such small quantities, that it is a difficult matter, without special search, to discover their localities, unless by mere accident in the course of visiting the respective countries to which the examples belong. It would appear, however, that, as a whole, comparatively little has been done towards illustrating this kind of industry as pursued on the continent of Europe, except so far as the higher manifestations may be concerned, such as muslin, lace, and embroidery: a few quiltings are to be found here and there, but, with the exception of a few French waistcoatings, nothing of any peculiar excellence is visible. No doubt, our great reputation as manufacturers of cotton has done much to prevent a larger display on the part of our foreign friends whose *amour propre* was considered to be somewhat in danger by the contrast likely to arise between the English examples and those of our guests. We think, however,

NEWSPAPER ILLUSTRATED LONDON NEWS

that a more extended exposition on both sides would have been valuable to each.

FRANCE.

The French have arranged their examples of raw cotton with other raw materials in the avenue under the North Gallery, near the passage leading to the central refreshment rooms. Here, in conjunction with a beautiful display of raw silk, are specimens of cotton from Algiers, the examples varying very considerably in colour and in quality. The best appears to be Kaddous cotton (*coton de Kaddous*); and with the specimens are yarns spun from the same—360s single yarns being the highest number, and the yarn so spun is of the quality of the above-named. There are also several examples of cotton from the French colony of Louisiana, thus showing that our neighbours are alive to the importance of endeavouring to help themselves in this particular; and the probabilities are, that so far as Algiers is concerned, they may succeed in the lower qualities.

The manufactured specimens at present arranged for display are very few. Specimens of quiltings for waistcoats, exhibited by Messrs. Vacossin, are to be found under the South Gallery. These are very excellent in design and in execution, the coloured effects being well thrown in, and producing a tasteful and satisfactory result. In the South Gallery, in the midst of a display of printed fabrics, Messrs. Hartmann and Son, Munster, Upper Rhine, exhibit yarns ranging to 353s English, with specimens of Madapolans and other cloths of excellent quality.

BELGIUM.

With the exception of specimens of quiltings from the Government workshops at Wellerin, which are of a respectable character and in considerable variety, there is little to notice from Belgium. M. J. F. De Cuyper, of St. Nicholas, exhibits common checks and tickings; and these, with specimens of cotton blankets by M. A. De Behault du Carmoi, of Ternonde, constitute the leading features of the Belgian display in the cotton trade, which is the more remarkable as much attention has been paid to its progress by the Government of the country. The laces and embroidery, Brussels and Valenciennes, will, however, compensate for any deficiencies in the lower textiles.

AUSTRIA.

From Vienna, J. Ramedep (300) sends examples of quilted cotton counterpanes, into which figures are introduced in dyed thread. The effect is good, and the designs have much merit in their special direction. Cravat fabrics and ginghams are also exhibited from Vienna, by J. Furst (296); whilst A. Budinsky, of Reichenburg, Bohemia (393), makes a display of muslins, in addition to hosiery and other articles.

WIRTEMBURG.

Window-curtains, of good design and excellent execution, exhibited by Van Zwerger, Deffnerp, and Weiss, of Ravensburg (52), give a good idea of the perfection to which this class of manufactures is carried in this industrious and thriving principality. There are also some striped muslins, too, of excellent make, whilst the lace curtains in the manner of *appliqué* are very beautiful in style and workmanship. As these are placed near the Central Avenue, they will be easily found and recognised.

SAXONY.

The arrangements of the contributions from Saxony are an example to the whole Exhibition; and, in addition to this, the Saxon Commissioners have printed a catalogue of their own department, containing much useful information, together with a list of prices. There has been a good understanding amongst the manufacturers, and they have united with good effect for the exposition of their respective trades. The contributions in mull jacconet, cotton gauze, and linen cambric, are generally very good, as also the cotton hosiery. There is, however, a very admirable display of cotton fringes, by G. T. Bach and Son, of Bucholz (158), which, though exhibited for cheapness and execution, certainly excel in the latter and in design; and the same may be said of their neighbour, Hans Helweg, also of Bucholz (159). Altogether, this exposition of cotton fringes is a most satisfactory one, and will give hints of some value to our manufacturers. These fringes, as also laces, galloons, gimps, and tassels, are manufactured in the centre of Saxony and give employment to many thousand persons. The exhibitors are merchant manufacturers in the towns of Augsburg and Bucholz, and the system of distributing the work over the adjacent country seems to be very similar to that pursued in Scotland and the north of Ireland, to which, as already promised, we purpose directing attention in a future notice of linen and embroidery. Much of the business carried on in Saxony seems to be done in this way, rather than by our factory system.

UNITED STATES.

As might have been expected from the country whence we get the great mass of our cotton, examples have been sent to show how far the manufacture of the raw material with which it supplies us has been carried; and though not a very extensive display, yet it is as a whole well worthy of attention, and in many points of high commendation in the more useful fabrics. The cotton sail-cloth, for instance, exhibited by Messrs. Fox and Polthemus, for the Willimantic Duck Company, state of New York, is an example of the application of an abundant material to a very valuable purpose, and it is scarcely possible to conceive a finer looking article. In its way there is nothing like it in the Exhibition. The drillings, too, are very good. The Amoskeag Manufacturing Company, Manchester, New Hampshire, also exhibit drillings of various qualities, striped shirtings, tickings, and sheetings—all good examples of their class. The Ocean Steam Mills, Newbury-port, Massachusets, display cloths for printing, sail-cloth, sheetings, and jeans; and extra fine straw twist is shown by the Wamsatta Mills, New Bedford, in the same state. Altogether, the United States cottons are at once creditable to the skill and ingenuity of their manufacturers, and a proof that in the utilities of manufacture they are rapidly learning to help themselves.

We have thus completed our sketch of the state of the cotton manufacture as represented in the Exhibition; and, without discovering any striking novelty, it is certain that on examination it presents many features of high interest, and more than ordinary commercial importance.

EAST INDIAN AGRICULTURISTS AND AGRICULTURE.

NORTH AND SOUTH BAYS WEST OF THE TRANSEPT.

The collection of machines, tools, manufactures, and models of the various trades and callings of the natives, afford a series of illustrations of the condition of that extraordinary country, which cannot be passed over in a few words. Among the manufactures are specimens of purely native work, and of imitations or copies from European models. From an examination of the latter, it is quite plain that the native Indians are as capable of learning improvements in mechanical arts as Europeans; while both in jewellery and in weaving there are specimens which the best European mechanics would have great difficulty in equalling. But when we turn to the agricultural implements and tools used by mechanics, at first sight it seems extraordinary that no advance should have been made for centuries. The Hindoos of the present day seem to have had handed down to them an unbroken legacy of the agricultural and manufacturing arts of the ancient Egyptians. A comparison of the models in the East Indian collection with the drawings of the same kind of implements in use among the Egyptians, affords a number of very curious coincidences. But, without tracing back the history of these agricultural tools to such very remote periods, we find, by Abul Fazl's chronicle of the reign of the Mogul Emperor Akbar, that, 300 years ago, rice, wheat, sugar, indigo, hemp, sugar-cane, and cotton were cultivated with at least as much skill as at the present day; as high a rent was paid for land; and the numerous regulations on the subject of irrigation, and the allowances to cultivators under losses, and the estimates of revenue raised given by Abul Fazl, show that a great part of central India was under regular cultivation.

Why this people have made so little progress, why the great bulk of them are in the same condition, moral, social, and intellectual, that they were in 300 years ago, is a question too large to be discussed here; but we may venture to point out certain obvious reasons. The first is to be found in the narrowness of their wants. Look at the army of little figures, modelled from life, representing various trades and callings, chiefly in Bengal, which are exhibited in the north bay of the Indian collection, and observe how little these people need, how few are their incentives to exertion. Putting out of the question domestic servants, like the butler and groom, whose clothes are part of their master's state, it will be seen that the native rural population need scarcely any clothes. The gardener, the shepherd, the village waterman, the carpenter, the blacksmith, the ploughman, the waggoner, and a number of others of the same rank, wear nothing except a cap or turban (the Hindoos have adopted the turban from their Mahommedan conquerors), and a piece of cloth round their loins, which is occasionally used rather as an ornament than as a covering, thrown like a Highlander's plaid over one shoulder. Oil—to obtain which, linseed, sesamum, and palma Christi are largely cultivated—is liberally applied to their naked skins, in the place of those coats, breeches, waistcoats, shirts, and stockings, which so largely absorb the funds, and employ the population, of the inhabitants of colder climates.

What would the Great Exhibition be, in the two great displays of machinery and textile manufactures, if we dressed like the Indian population?

The Zemindars and great Indian gentlemen hold the same feelings with respect to garments as their subjects and tenants. Clothes, with them, are ornaments, not necessaries. After appearing in public blazing in jewellery, in shawls of countless price, and gold-embroidered silks, on an elephant or a prancing Arab, as represented in the model of an Indian fair, an Indian Prince, Sir Thomas Munro tells us, will pull off everything, and sit semi-nude in a calico wrapper, just in the same manner that we Europeans relax in slippers and dressing-gown. Magnificent embroidered shirts and shawls, like those hung up in the Indian tent, are often heirlooms in a native gentleman's family.

Then, again, the system of vegetable food, cooked in the simplest manner, promotes an economy which is very much opposed to the commerce and competition on which improvement rests. But the chief cause of the stagnation of mechanical arts in the interior of India (leaving out the question of religious influences) is to be found in the extraordinary state of isolation in which the rural population live.

There are no made roads in the interior of India; where the natural roads are sufficiently good carts drawn by one, two, up to twelve bullocks, cows, or buffaloes are employed; and excellently well constructed for the purpose are these carts or drays for ascending or descending precipitous hills, with the small weak cattle of the country, as may be seen in the models in the southern bay. But it is only for short distances, or in the neighbourhood of great towns, where roads have been made, that carts can be used at all. The chief mode of conveying produce and merchandise in India is on bullocks' backs. In the north bay, a set of models of loaded pack bullocks will be found. In the rainy season, when for an uncertain number of months the rain pours down in a deluge, travelling with merchandise or produce becomes all but impossible; dry water-courses grow into dangerous torrents, and villages cannot depend on supplies from their neighbours. The evils of this geographical isolation are to a certain extent alleviated by a system which discourages intercourse between village and village.

The rural population of India is not spread over the country in detached dwellings, but lives collected in small villages or towns, for protection against robbers and wild beasts, and are each in themselves miniature commonwealths. They are like islands, with very little external commerce and no internal competition. The mechanical arts and several other callings are placed in the hands of parties who are public officials. The blacksmith, the carpenter, the potter, the ropemaker, the shoemaker, as well as the water-carrier, the barber, the butcher, the washerman, the goldsmith, the poet, and the astrologer, receive each a piece of land rent-free, and a stipend in grain or money from each villager, in return for which they are bound to perform the duties of their respective vocations, to make ploughs, build houses, dig wells, shave heads, tell tales, and cast horoscopes for the community. No system could have been devised better calculated to render mechanical arts stationary, and each little population is perfectly independent of foreigners. Competition is unknown—trades are hereditary—improvements of machinery never displace hand labour. The land is the property of the supreme Government, and every head of a family has a piece of it. Almost all laws are defrayed by a tax, which is, in effect, the rent of land. In fact, the condition which certain social reformers desire to carry out in Europe is realised, and has been realised for centuries, among the Indian villages.

Bad roads, rivers, jungles, marshes, tigers, and robbers, effectually fill up the place of custom-houses and protective duties. Agricultural improvements are useless, where surplus produce would be valueless, because it would never pay to carry it to market.

Under these circumstances, the quarter of wheat is worth from 7s. to 10s.; famines are periodical, and improvements are unknown in the interior, while on the coast ships are built, furniture is manufactured, and English goods of many kinds are executed with very great skill, of which examples have been sent.

Among the agricultural implements, we must note that the Indian plough is not ill adapted for its intended purpose. The shape is nearly the same as that of the Roman plough, and less rude than that employed by our Saxon ancestors, which was attached to the tails of their bullocks.*

The Indian plough is chiefly used for stirring up and running a furrow through moist ground, preparatory to sowing rice. It does not answer to dry up the land by turning a furrow. The mould-board of the English plough has been used in some tropical countries and abandoned. Dry land for other crops is broken up with coarse hoes, of which full-sized specimens will be found under the table on which the agricultural models are displayed. These hoes, except that they are shorter in the handle, are of the same shape as those still in use in the West Indian islands, where the plough has not been introduced. It is also the implement of the modern Egyptian peasantry.

The ploughs in the southern bay consist of a taper piece of wood, shod with a sort of spear-head of iron, which forms the share, the sole being of wood, without either mould-board or coulter. Into the wood a handle is fixed, one or two buffaloes are harnessed, and the ploughman, naked all but a bit of cloth round his loins, holding the handle in one hand, and the reins in the other, will get over more ground than could be accomplished with an English plough, quite effectually enough for his purpose. Into the furrows the rice is dropped, and covered by one of the harrows, of which several models and one full-sized implement are shown, made with iron, and wooden teeth. These harrows are much more finished works than those often used in the bush of Australia, where wheat is harrowed in with a bough of a tree, or by running a flock of sheep over the ground.

The Hindoos generally get two crops of rice off the same ground—the first for food, the second for straw; and there is reason to believe that successive crops of this grain, which is the staple of the native population, except in the north-western province, where they live on wheat cakes, has been grown on the same fields for a thousand years. Rice-fields must either lie on the banks of rivers, flowing at a level where the soil can be fully saturated and at a proper time flooded, or artificial irrigation must be resorted to.

There are a number of hydraulic machines exhibited of the kind used for irrigation, on which so much tropical cultivation depends. It is one of the arts we have yet to learn and apply to our semi-tropical colonies. In one instance, in the north bay, six bullocks are to be seen employed in hauling a leather bucket out of a well in the same manner that we sometimes see a brewer's horse haul an empty barrel out of a cellar. It is impossible to imagine a more wasteful employment of power. In the south bay are several endless-chain buckets worked by bullocks moving a gin or horizontal wheel round. In another instance the bucket is raised by the lever principle.

We would suggest that this set of models might afford the means of a very useful and interesting lecture on the application of simple machinery to irrigation. To intending colonists, such lessons would have great value. Our agricultural schools and colleges, which are preparing many colonists, should take up the question. The resources of the very promising colony of Natal cannot be developed without machinery for irrigation, as the principal rivers run between deep steep banks.

Five or six models of hoes drawn by bullocks are shown: these are used in the cane-fields exhibited. It is plain that hundreds of years before Jethro Tull wrote on the sovereign merits of horse-hoeing, part of his system was in practice in Central India.

In all these implements iron is used where it can be got; and no doubt, if we succeed in bestowing railroads on the Indian peninsula, a rapid improvement in all the mechanical implements will follow the cheap conveyance to new markets which railroads will create.

The implements variously known as "scarifiers" and "extirpators," and "cultivators," which first began to attract notice in this country about forty years ago, have long been known to the Indian farmer, and are constructed very efficiently for working in light land. They consist of a set of teeth shod with iron, arranged in a heavy bar, and drawn by a bullock.

The sickles with which the grain is reaped are shown, with a model of the floor on which it is trodden out; and on the wall of the South Bay hangs a rope muzzle for "muzzling the ox that treads out the corn." This plan of treading out grain is not confined to the East; it is practised in Spain, in South America, and occasionally, when labour is very scarce, in Australia. The corn is winnowed by throwing it up against the wind. The next operation (that is to say, grinding) has been illustrated. Two women are squatted down opposite each other, having a pair of millstones between them, of which the upper one fits into a hollow in the lower one: a handle is fixed eccentrically in the upper stone in such a manner that one of the two women is always pulling towards her. This implement is as old as the time of Job.

The last operation of Indian agricultural economy to which we will refer is the manufacture of sugar, which may be seen near the level on the north bay. Two grooved rollers of wood, placed face to face, are turned by two men with handspikes, while two or three sugar-canes are thrust between them: the small percentage of juice extracted by this imperfect force falls into a pan below, and is thence conveyed to open earthenware pans, which are shown boiling close at hand. And yet India sends us a good deal of sugar.

After a very cursory examination of this picture of the rural life of the Indian population, presented in this very curious set of models and figures, it is impossible to doubt, that, with the increased means of communication which roads and railroads would open, the interior of central India is capable of affording a largely-increased exportation of cotton, sugar, rice, linseed, hemp, and other staples peculiar to the soil and climate; and that the result of increased intercourse would be to greatly improve the social and intellectual condition of the native population, and to render them better customers for the manufactures, which we can produce so good and so cheap.

At present we shall not say anything respecting the set of looms exhibited for weaving cloth, shawls, and carpets (the last is on a working scale), but be content with observing that since, by the powers of our mechanical inventions, we are able to import cotton from India, manufacture it, and import at such a price as to undersell by 75 per cent. the half-naked rice-eating producer of the finest muslins, it is as much our duty as our interest to assist in stimulating the growth of cotton and other agricultural produce of India.

At a convenient opportunity we shall continue our notices of a department of the Exhibition to which large additions have lately been made.

* The act of the Irish Parliament, forbidding, under penalty of fine and imprisonment, "a barbarous custome of ploughing, harrowing, drawing, and working with horses, mares, geldings, garrans, and colts, by the taile, whereby the breede of horses is much impaired in this kingdom," was not passed until the reign of Charles II., in 1634.

ARTICLES FROM THE INDIAN ARCHIPELAGO.

THE contributions forwarded from the islands of Java, Borneo, Sumatra, Celebes, Singa, Malacca, and others in the Indian Sea, although possessing some degree of interest for the naturalist, the agriculturist, and the manufacturer, do not form quite so attractive a collection as those from the Indian continent. A portion of these articles, we perceive, have been forwarded by the Sarawak authorities, and the remainder by the local committee of Singapore.

From Borneo the collection of natural productions is large, including, as it does, a considerable variety of woods, ornamental and useful; grains, minerals, utensils, agricultural implements, and arms and accoutrements. The greater part of this portion is from the north-west coast of the island.

The agricultural and industrial implements from Singapore, Sumatra, and Malacca, are interesting from their extreme simplicity. The plough, for single or double yoke, although not quite so primitive as that in use in Ceylon, is still of ancient date. The harrow, the scarifier, and large hoe, all appear to be much as when designed by the first inventors, and bear full testimony to the abundance of labour, and the light loamy character of the soil in those sunny regions. Far more taste and ingenuity would appear to have been exercised upon the *siri*, or betel-box, and the betel-nut cracker, than upon their household and field implements. The little silver cracker which serves to bruise, and silver or gilt box which contains, the betel-nuts used by the inhabitants of these islands for mastication, are really elegant articles, and have, doubtless, received many modifications in their make; but the remark we find attached to one of these, to the effect, that, as yet, they have not been imitated, and shipped to the East, by any of our British manufacturers, is a mistake, as regards several parts of India. Betel-boxes and crackers have been for years past articles of manufacture at Birmingham, just as have the bangles and bracelets, all of which are freely exported to India and Ceylon. The carts employed in Java and Singapore bear a close resemblance to the gharree of continental India, and the bandie of Ceylon, especially the smaller description for two bullocks. To a European these vehicles appear unserviceable from their heaviness and clumsy build; but, looking to the wretched condition of most Indian roads, they are, in reality, the only description of cart which could be employed to advantage for bullocks. In many parts of India, especially throughout the cotton districts of Tinnevelli, there are no roads whatever, and the cart-driver directs his cumbrous but substantial carriage, as best he may, over the sandy rocky plain, between stumps of trees and masses of stone.

The hand-looms, the cotton-presses, the oil-mills, the sugar-grinders, are all of one simple make, as primitive in their form as they are possible to be; and all alike bear testimony to the cheapness of human labour in those countries. In the cotton-presses and sugar-mills of India we find no multiplying power, no complication of wheels; the labour is performed by means of one simple prime mover, worked by direct power.

Although the silk sarongs and salendongs embroidered with gold have a rich and picturesque appearance beside the more simple cotton fabrics, they can hardly compete with the costly fabrics of the Deccan, Oude, Delhi, and Guzerat. By the side of the Java sarongs are similar goods from Jerpore, Cutch, and Boowa. Nearly all these cotton manufactures are of very low quality, and the dyes heavy or sickly in hue. The style of some of the Cutch goods is curious, and they have, perhaps, a rather showy appearance, but they lack quality. The towelling, &c., from Beerbhoom, though not bad, hardly equals the texture and make of the Patna diapers and towels, which are really of excellent make and pattern.

Among the vegetable productions, raw and prepared, exported from the Eastern Archipelago, not the least important are the coffees, spices, and teas of Java. The cultivation of cinnamon was introduced into this island about twenty years ago, a number of young plants and "chalias" having been taken thither from Ceylon, where, at that time, the high price of the spice made it a very profitable occupation. About 5000 acres of land have been planted with cinnamon, and the prepared spice has for some years past formed an important item in the shipments from Java. The quality, however, is far below that of the Ceylon cinnamon, as may be seen by a comparison of the samples exhibited from each country. It is chiefly shipped to Holland, where it finds its way into some of the Continental markets. The samples of coffee from the Soorabaya and Passeruang districts of Java are of fair average quality; but do not appear to much advantage by the side of the Madras coffees, the produce of the estates lately formed on the Sherwarry Hills, at an altitude of 2000 feet above the sea. This article is one of large amount to the Dutch Government, and, as well as sugar, is mostly cultivated by forced labour, or brought in to the Government stores for sale at a fixed low rate.

The teas exhibited from Java as the produce of the Government plantations, are chiefly pekoe and congo, but do not seem to be of very particularly fine quality, though said to be manipulated by Chinese workmen: they appear to be inferior in make and aroma to the Assam teas, which are shown to some advantage by their side.

If we cannot say much in praise of the coffee, tea, and cinnamon of Java, we must at any rate admire the spices from the Moluccas, Penang, &c., as being of first-rate quality. The samples of nutmegs, mace, pepper, cloves, &c., are perfect of their kind, and the visitor will be much pleased with the beautiful appearance of the ripe nutmeg enclosed within its network of rich red mace, preserved as it grows upon the tree. A more lovely sight can scarcely be imagined than that of a nutmeg or a clove tree in full bearing, loaded with its rich clusters of yellow and red or brown fruit, which offers a fine contrast to the deep emerald green of the tropical foliage, lit up as it is by the noon-day sun, and waving to and fro in the cool sea breeze. We regret that specimens of fruits and seeds, similarly preserved in their original state, have not been sent here from other countries. The coffee berry, the cocoa bean, the cocoa-nut in flower and fruit, and many others, are all beautiful objects, and might readily have been preserved.

Some of the cordage and ropes made from new varieties of fibrous substances, struck us as being apparently of fair quality. We may instance the cords from the wild aloe, the plaintain, the pine-apple, the

Hibiscus cannibinus, and some other materials peculiar to the Archipelago, such as ejou, gogoo, dunchu, hemp, &c. A good deal of attention has of late years been given to some of these substances by the Madras and Ceylon authorities, and we have seen in India some beautiful fibres produced from the pine-apple, the wild aloe, and the *Hibiscus*. The former and latter of these grow most readily in any soil, and we shall not be surprised to learn that in time they form the basis of some extensive manufactures.

The medicinal oils and spirits forwarded from

2.—KNOCKER.—BY FEETHAM, CLIFFORD-STREET.

this part of India, as well as from other Asiatic regions, scarcely admit of comment from any true professional men, and require to be tested experimentally before their reputed value can be properly estimated. The woods are numerous, and some of them of rich and close grain; but without some further particulars than are to be gathered from the Catalogue, we cannot venture an opinion on them.

The gutta percha manufactures are eclipsed by those made in this country by Mackintosh and others. The minerals, ores, &c. will, however, repay a careful inspection by any who are curious in such matters.

To obtain a view of the models of vessels and boats of the Archipelago we must cross the great nave, and, on the north side, in the East Indian section, we shall find specimens of the prahus, sampans, and padewahkans of Sumatra, Singapore, and Mindanao. The Samm pirate prahu of the first class is an imposing-looking craft of about 120 tons, manned by 80 or 100 men, and armed with six long swivel carronades, and a heavy stern piece. These are truly formidable vessels when met in any numbers, as they usually are; and to any but steamers or men-of-war are most unwelcome visitors. Until of late years they infested the Eastern seas in vast numbers, cutting up the native trade, and frequently capturing European merchantmen. The active services of her Majesty's war-steamers, and those of the East India Company, have, however, pretty well scoured those waters; and it will not be long before their calling will be obsolete, and their very existence a tale of bygone days. It was not long since that so many as a thousand of these marauding craft were following piracy on the open seas; and by their swiftness, and their suitability to the dangerous navigation of the many eastern islands, eluding the utmost vigilance of our men-of-war. It was not until steam-vessels were brought against them, that any successful attempts were made at extirpating them.

4.—SILVER GROUP OF SIR ROGER DE COVERLEY AND THE GYPSIES.—BY JOSEPH ANGELL.

WEAPONS OF WARFARE.

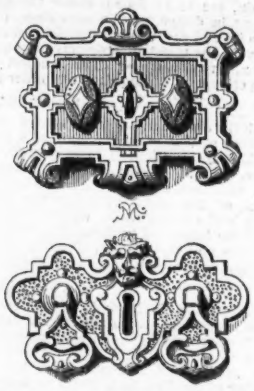
Interspersed among the products of Peace and Industry, lying side by side with the instruments of agriculture, commerce, and luxury—a strange companionship that might well suggest the lion lying down with the lamb, in the millenimum of '51—are to be seen specimens of the countless varieties of implements of death and destruction which man employs against his fellows.

Without going into the question of whether war is really a necessary evil in the present state of human nature and political society, we propose to introduce to notice some of the principal objects in this department of the Exhibition, as well as to give a slight glance at the weapons of war in bygone times, when death was not dealt out on such scientific principles as at present.

We read, a few days back, a paragraph, extracted from a Transatlantic journal, which spoke of a newly-invented pistol, which had been sent as a donation to the Anti-duelling Society, and which, it was said, if generally adopted, would effectually compass the avowed objects of that association. This pistol was so constructed, that, however pointed, it would inevitably kill the person firing and his second. This wondrous machine certainly seems to promise well for the end proposed; and taking the hint from this pistol, we may (strange though it seem) congratulate the lovers of peace upon the thoroughly exterminating powers of several of the articles now to be seen within the glittering walls of the Crystal Palace.

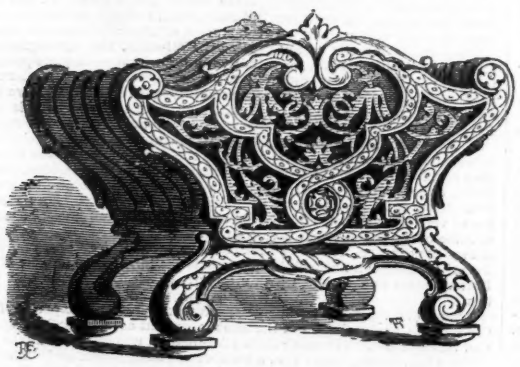
It may not be uninteresting, in the first place, to turn to the past proficiency of the world in the manufacture of warlike weapons, which is brought forcibly beforeus by some specimens of the primitive weapons still used by savage nations. Perhaps one of the most obviously simple of these is a New Zealand war club, which is a piece of stone about a foot in length, merely cut into shape. From the western coast of Africa we have bows and arrows, spears, and other rude weapons. Most of these, however, are ornamented by carving, some of it being both elaborate and beautiful.

In the savage state these and such as these are still the weapons used in war—sharp stones, clubs, the pointed horns of different animals affixed to a pole in the form of a spear; the bow cut from the trees of the forest, strung with a thong of some wild animal's skin; arrows formed of reeds, and headed with sharp pointed stones; the sling for throwing stones; the knife, formed either of flint or of the teeth of the shark tied on to a stick (of which we have a curious specimen from New Zealand).



3.—SCUTCHEON AND HANDLE FOR DRAWER.—BY FEETHAM, CLIFFORD-STRET.

Turning to the more civilised instruments of destruction in the Crystal Palace, and, without taking any regular course, dotting down a few notes of the most striking objects in the order in which chance may bring them under our view, we find ourselves in the department allotted to Prussia and the small States. Here we have improved rifles, with a very excellent contrivance for loading at the breech, from Dusseldorf; and another rifle, from Magdeburg, with two barrels bored in a converging direction, so as to direct the balls to the same mark. Close by is a rifle from Bavaria, beautifully ornamented in the old German style, with a series of engravings along the barrel of the history of arms—commencing with Nimrod, with his bow and arrow; showing the invention of gunpowder; the flint-lock, &c.; and finishing with the percussion cap. Here, too, we have every variety of swords, fine-tempered weapons, light fencing-swords, heavy elegant cutlasses for cavalry and infantry service, superbly inlaid dress-swords, and specimens of the waved blade, formerly fashionable in the Prussian service. One sword in this compartment, a beautiful bit of workmanship, bears the following inscription in German:—"To the hero of Komorn, the General George Klapka, as a token of their respect and friendship, from A. and E. Hoeller, Solingen." There are also splendid specimens of gun-barrels of common wire, of flower damask, of Turkish damask, and various others which amply repay inspection. We must, however, hurry on, not omitting to notice as we pass a beautiful steel cannon, which seems to guard the frontier of the North Germany compartment, being stationed at the entrance to it from the centre aisle. France also sends a very large assortment of arms, swords, guns, and bayonets; and from Spain we see some elegant blades, the inscription on which, "Fabrica de Toledo," suggests the remembrances of ancient chivalry. One of these is a wonderful instance of fine temper. The scabbard, which is very chaste in design, represents, with the hilt of the sword, a serpent, completely coiled round in a circle. The blade, when inserted into the scabbard, takes this curve, but the instant it is drawn it becomes perfectly straight. A brass howitzer, of 9-inch calibre, from the Royal cannon foundry, Seville, called the "Formidable," and, from its



5. CANTERBURY.—BY JENNENS AND BETTRIDGE.

6.—SILVER INKSTAND.—BY MARTIN AND CO., CHELTENHAM.

7.—CANDELABRUM.

9.—ARM-CHAIR—PAPIER MACHE. BY JENNENS AND BETTRIDGE.

8.—CANDELABRUM.

10.—TIARA.—BY M. M. BOUILLETTE AND COMPANY

11.—CLOCK.—BY MESSRS. B. AND J. MOORE.

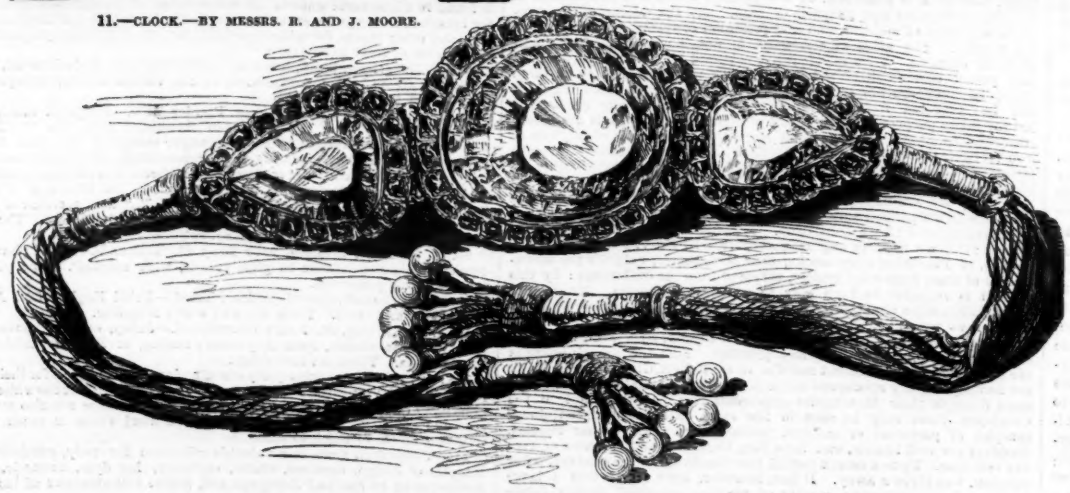
12.—KOH-I-NOOR, AS ARRANGED IN THE GREAT EXHIBITION.—EXHIBITED BY THE QUEEN.

size, amply deserving its name, is not likely to be passed unnoticed. Belgium sends us some rather heavy metal from the Royal foundry, Liege, as well as a copious collection of small arms.

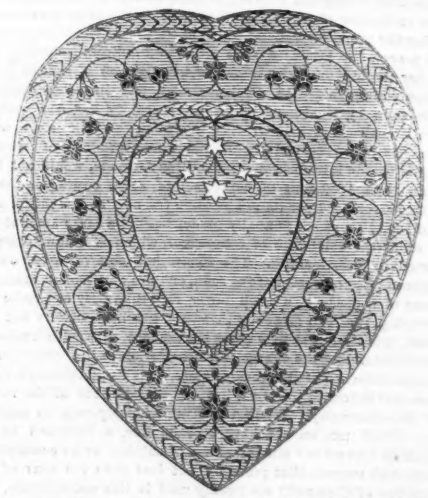
In the United States department we noticed some rifles and pistols on the "revolver" principle. They have but one barrel, which is stationary, the breech alone, which contains the load, revolves, each portion of it coming in its turn to the barrel.

The Turks contribute some of their peculiarly picturesque weapons.

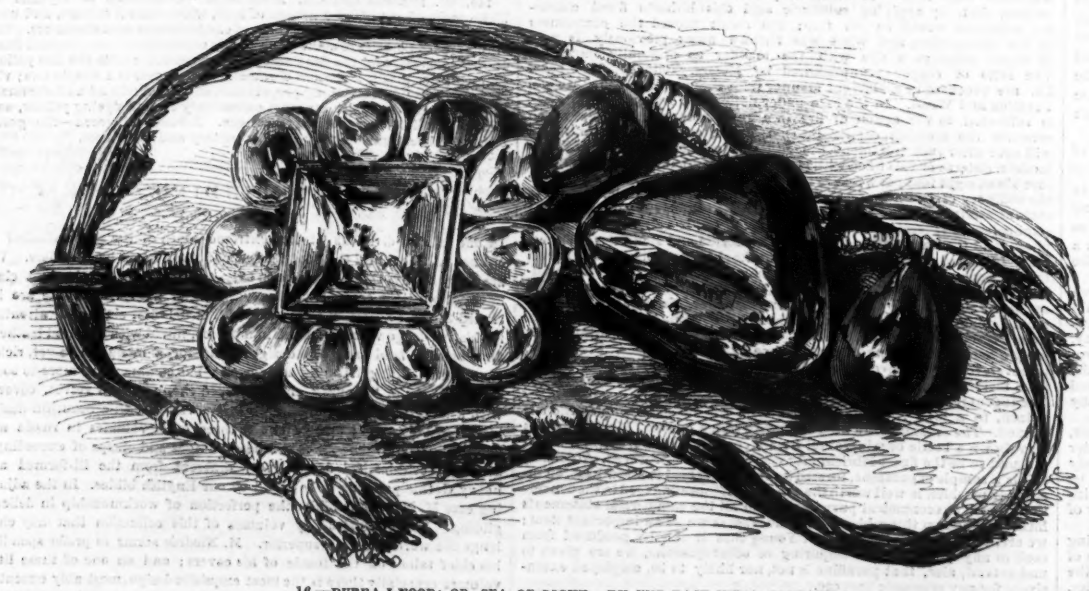
13.—SILVER CLARET JUG.



14.—KOH-I-NOOR (MOUNTAIN OF LIGHT) IN ITS ORIGINAL SETTING.—BY HER MAJESTY.



16.—HEART-SHAPED DISH OF JASPER, JEWELLED.—BY THE EAST INDIA COMPANY.



16.—DURRA-I-NOOR; OR, SEA OF LIGHT.—BY THE EAST INDIA COMPANY

Guns and pistols, heavy and massive, with inlaid gold and silver, and with stocks of all strange shapes; sabres, knives, and daggers.

Canada, in addition to the articles appertaining to the native Indians, sends some very beautiful rifles, &c.

A very interesting collection of weapons is exhibited by the East India Company. Bows and arrows, beautifully made and elaborately ornamented; matchlocks, inlaid with the greatest skill, from Lahore, Jugdispore, Rajpootana, and other parts of their vast territories. A fine specimen of chain armour, and a head cover from Rajpootana. A very curious gun, to fire from the back of a camel, from Lahore; battle-axes, clubs, &c., and cannon of different sizes, from small models up to some very murderous-looking field-pieces. In addition to these are one or two objects which call for especial mention. A sword with a fine Damascus blade is quite a curiosity, of nice exactness in fitting. It is a perfect sword to all appearance, and can be used and tested as such in all the usual ways; but by touching a spring in the handle, it splits, and forms two perfect swords with two perfect edges, so closely joining that when together the single edge seems of almost razor sharpness. A shield, manufactured in the arsenal of his Highness the Rajah of Kola, in the states of Rajpootana, is also very ingenious. It has four gold bosses, in each of which is concealed a pistol. A sword with a pistol in the handle, which can be fired while the sword is held in the usual manner, is also to be found in this compartment.

A good illustration of savage warfare may be seen in the model of a New Zealand war pah, contributed by Lieutenant Balneaves, H.M. 58th Regiment, which shows the method of fortification, by means of pallisading, &c., adopted by the natives. The watch-towers at all the salient angles, made in the form of hideous figures, and painted with "the ochre of wrath," are characteristic.

Of our native contributions, as might be expected, Birmingham takes

the lead, and exhibits a very large collection of small arms and swords. A very instructive collection is exhibited by Mr. H. Hart, of that town, showing the complete manufacture of gun-barrels, from the old horse-shoe stubs of the earliest periods to the latest improvements.

While upon the subject, we must not omit to notice the invention which, though not exactly relating to weapons of war (being adapted chiefly to sporting guns), still will hardly be thought out of place while treating of guns. It is "Erskine's newly-invented waterproof and safety gun." The object of this invention is to provide in one action against the percussion-cap being prevented from exploding by exposure to the rain, and also to prevent the accidental discharge of the gun by the hammer falling. This is effected in a very simple manner. A metal shield containing a ring of Indian-rubber encloses the cap completely, so as to keep out all damp, and at the same time prevent the hammer striking the cap, should it fall accidentally. The instant the gun is brought to the shoulder for the purpose of firing, a spring in the butt of the gun, by the mere pressure against the shoulder, immediately releases the shield, which flies up and leaves the cap free for the action of the hammer. There are other improvements in connexion with this, but the above is the chief invention; and from its eminent simplicity and great utility, it will, we have no doubt, be generally adopted.

The swords also exhibited, from Birmingham, are very beautiful specimens of cutlery, and fully sustain the reputation this town has so long enjoyed for that particular manufacture. It has often been disputed when the making of swords commenced in England, and very little is known for certain on the subject. A MS. psalter, written about the time of Stephen, and preserved in the Library of Trinity College, Cambridge, gives a representation of two men grinding a sword-blade at a large wheel. Although there is little doubt that swords were manufactured in England at a very early period, the blades made in Spain and Italy, and more especially those brought from the East, were considered very superior to the English swords. The Toledo blades, which are still celebrated for their exquisite temper, were eagerly sought after in the time of the Romans. During the eighteenth century, English blades had fallen into such disrepute, that in 1783 the sword-sellers petitioned the Lords of the Treasury for permission to import sword-blades from Germany. This naturally drew public attention to the humiliating inferiority of English workmanship in this particular branch, and led to important results, in fact, to the present excellence of the Birmingham manufacture. In December, 1783, Mr. Gill, of Birmingham, memorialised the Lords of the Treasury, stating that he could make sword-blades equal to those of Germany, and requesting a fair comparison. This public trial, however, was, by some circumstance or other, continually postponed, until, in 1786, the East India Company, requiring 10,000 horsemen's swords, they divided their favours among the English and German makers. Mr. Gill determined not to lose the opportunity for the comparison he courted, spared no endeavour to obtain it, and he was successful. Every sword sent in was submitted to a severe test, by means of a machine recommended by the celebrated Matthew Boulton of Soho, by which the blades were forced into a curve which reduced the length from 36 inches to 29½. The result was, that of Mr. Gill's swords 2650 were approved, and 4 rejected; of the German manufacturers, 1400 were received and 28 rejected, giving a superiority to Mr. Gill in the ratio of about 13 to 1. As a proof, however, that the complaints against the English makers were not without foundation, We find that of the other English swords (besides Mr. Gill's), there were 2700 approved, and 1084 rejected, being about two bad ones to every five good ones! However, the state of the manufacture in Birmingham at the present day, as witnessed in their show at the Crystal Palace, may well serve to wipe off the disgrace of this former shortcoming.

We should mention, before we close this article, that the manufacture of swords is also shown in all its stages.

Two noble guns, too, from the Low Moor Iron-Works, one a 52-pounder, and the other for 10-inch shells, should not be omitted; they are mounted on improved carriages and slides.

CHEMICAL AND PHARMACEUTICAL PRODUCTS.

THE benefits conferred on society by Chemistry since the opening of the 19th century have been enormous, causing millions to circulate annually, where thousands sufficed previously, besides reducing the cost to the consumer of various useful articles, giving at the same time employment both directly and indirectly to large numbers of workmen. A glance at a few of the most prominent improvements, and also at the extensive scale on which some chemical manufactures are conducted, will be of service at the present time.

Foremost among them is the improvement of Howard by refining sugar in vacuo, which is also now adopted in making extracts from vegetable substances of easy decomposition at elevated temperature. The extraction of sugar from the cane is likely to be greatly increased by either the use or some modification of the recently introduced lead process. No process has produced such direct and indirect influence on so many of our staple manufactures as the introduction of that of Le Blanc for decomposing salt with sulphuric acid, and its subsequent conversion into soda by treatment on a reverberatory furnace with lime and small coal. Previous to this invention all our soda was derived from burned sea-weed (kelp), the whole produce of which, at the period of the introduction of Le Blanc's mode, would not be equal to more than 1500 tons of carbonate of soda, costing in the aggregate £300,000, or £200 per ton. The same can now be bought for £12 per ton, and 100,000 tons are annually made, besides a large amount of sulphate of soda (the salt cake of commerce), which is manufactured and consumed in glass-making. The diminished cost of soap, owing to the reduced price of carbonate of soda, enables our woollen manufacturers to scour their cloths at a much lower rate than they otherwise could. Although partial evil arose by throwing the kelp-makers out of employment, it is clear that four times the amount of wealth has been created; notwithstanding the charge of the material to the consumer is reduced to one-sixteenth of its previous cost. It is easy, therefore, to see what a powerful influence this must have on the comforts of the various classes of the community. When the King of Sicily was so imprudent as to levy a high tax on the export of sulphur, a thousand heads were at work to convert our mineral stores of sulphur to an economical use, and with such success, that probably not less than 400 tons of pyrites (the mundics of Cornwall) are weekly used in this manufacture, the produce of the British dominions: 600,000 tons of coal and 180,000 tons of salt are also consumed.

Indirectly connected with the above is the manufacture of chloride of lime, which is formed from the decomposition of the muriatic acid of the soda process by manganese, the chlorine being absorbed by lime in chambers constructed for the purpose. Were it not for this economical mode of preparing chlorine, calicoes could not be bleached as cheaply as they are, for the entire surface of the United Kingdom would not form a bleaching-ground sufficiently extensive to bleach by the old mode the annual manufacture of calicoes in England.

Another substance of importance in calico printing, viz. alum, has been reduced by chemical ingenuity from £100 to £10 per ton. On other substances, if the price has not been reduced, the skill of chemists has prevented an advance in price, equally thus benefiting the community. Such an instance is given below in the case of garranium. The introduction of chromate of potash as a dye is most important. At the commencement of the present century, native chromate of lead, imported from Siberia, was sold at 20s. per lb.; it can now be obtained at any respectable oilman's for 2s. per lb.

Owing to some remissness on the part of the great soda manufacturers, their processes are not shown at the Exhibition. It is difficult to render instructive the simple exhibition of a bottle, whose contents are merely some white powder. In the following notice of various cases it will be seen that we have endeavoured to convey, in the most important instances, a brief account of their manufacture, together with a history of their introduction to economical use.

In agriculture, chemistry has pointed out the proper course for manuring the soil. Though only partially put into operation, the manufacture of artificial manures is, however, on the increase; such, for instance, as the preparation of the phosphates by sulphuric acid from bones and coprolites. We hope, in a short time, that potash will be set free, in like manner, from our granites and felspars.

In coal gas we have a remarkable instance of the great benefits derived by society from the researches of chemistry, by converting the tar into naphtha for the solution of india-rubber and gum resins; the gas water into ammonia, ammoniacal alum, and salts of ammonia, or sal ammoniac, &c., to be used as a manure for fertilising the soil, or in arts and manufactures. Bisulphuret of carbon, which, up to the last ten years, was merely made in small quantities for philosophic inquiry, is now manufactured extensively for its powerful solvent qualities; to which substance also is due the merit of displaying the varied bright and shaded portions of the electro-plate, brilliant examples of which are to be found amidst the splendid collection seen at the Exhibition. Electro-metallurgy and electric telegraphs are the offspring of chemical science. After witnessing their prodigious infantile displays, what may we anticipate when the young giants have arrived at maturity? The demand for lubricants, required by our coarser description of carriages and machinery—such as the waggons and engines used in collieries and mines—has been supplied by a substance called grease, made from an oil procured by the distillation of resin forwarded from the backwoods of America, and obtained from trees felled by the hardy settler—the pioneer of a resistlessly advancing civilisation. This oil, when formed into soap by combination with soda, composes a very useful and cheap lubricant, greatly diminishing the otherwise increasing cost and waste of the more expensive articles, tallow, olive oil, &c.

In dyeing, the science of chemistry has been of such service, that a volume would be required to detail the all but innumerable advantages which our manufacturers have derived from this source. Over and above those detailed under the articles soda and chlorine, we may summarily state, that all colours vast parts or mordaunts, that either wholly or in part are composed of the following articles, have been greatly reduced in price since the opening of the present century; viz. alum, actate and nitrate of lead, chromates, sulphuric, nitric, and muriatic acid, chlorine, the prussiates, salts of tin, copper, ammonia, acetic or pyroligneous acid, &c. To the production by the chemist of iodine and bromine we are indebted for the proper preparation of plates for the Daguerréotype, &c.; and, lastly, it is not probable that the Glass Palace would have had an existence but for the reduced cost of the material, principally owing to the assistance of chemical science, not to dwell upon its agency in multiplying, cheapening, and facilitating the production of the gorgeous array of splendid and useful articles which the visitor to the Exhibition will meet arrayed around him on every side. The details of the manufacture, and other remarkable circumstances connected with the principal substances exhibited, will be detailed in what follows.

In Case 1, Messrs. Pontifex and Wood, Shoe-lane, Fleet-street, and who have chemical works at Blackwall, exhibit some specimens of the metallic products of which they are such extensive manufacturers; viz. copper, spelter (crude zinc), lead, and tin. There are also some very fine specimens of crystallised tartaric acid—the largest, we believe, ever shown. This substance, which is now so extensively used, is obtained from an impure bitartrate of potash, familiarly known as cream of tartar: the commercial form in which it is imported is that known as red and white argols, these argols being the lees or sediment of wine deposited in the course of fermentation. The thick crust on the bottles and casks that have been filled with red wine is principally composed of argols. The mode of manufacturing tartaric acid from argols consists in first bleaching it through animal charcoal; after which it is mixed with pulverised chalk and boiled, during which an insoluble tartrate of lime and soluble neutral tartrate of potash is formed: the latter is then converted into tartrate of lime by means of chloride of calcium. The insoluble tartrate of lime is then well washed, and treated with sulphuric acid, thus forming sulphate of lime and gypsum: the liquid tartaric acid is subsequently crystallised. Messrs. Pontifex, who are also extensive paint manufacturers, exhibit some interesting samples of colours and pigments, which will well repay observation. The mode by which they procure their sulphate of copper is worth relating. Messrs. Pontifex and Wood are, perhaps, the most extensive coppersmiths in the world. In the course of working heated copper, a large amount of scales are formed; these are treated with sulphuric acid, which combines with the exterior coating of oxide of copper, forming sulphate of copper, commonly known as bluestone. The interior metallic copper scales remain, and are remelted.

Case 5, C. Butter, Holborn-bars, has a very fine assortment of the rarer chemical preparations.

No. 6, J. Wilson, Glasgow. This gentleman is, perhaps, the largest alum manufacturer in the world. The alum shale is procured from the coal-mines near Glasgow, which is a pyritous bituminous schist: by exposure to the atmosphere and moisture, a chemical action takes place, and heat is generated in the pyrites, which is a composition of 30 parts of sulphur and 28 parts of iron. As the decomposition proceeds sulphates of alumina and iron (common copperas, or green vitriol) are formed. The alum of commerce is not, however, a simple sulphate of alumina. That article is a compound of sulphate of alumina and potash or ammonia: the latter is now manufactured on a large scale, in consequence of the cheapness and facility with which it can be procured from the ammoniacal liquor of our gas-works; but for many purposes the double salt of alumina and potash is absolutely required. In crystallising the alum large crops of crystals of sulphate of iron (copperas) are obtained. Mr. Wilson has in several cases shown the process of decomposition of the alum shale in various stages, highly interesting to the chemist and geologist, the filamentous character developed by the decomposition being remarkably like serpentine. In the same case is a fine and rare specimen of naphthalin, which is obtained by subjecting coal tar to distillation. It passes over after the naphtha or coal oil: it is not used in any manufacture. In No. 7, the next case, P. Spence, of Pendleton alum-works, near Manchester, exhibits the manufacture of alum from solid pyrites, obtained from the coal-mines: by this mode it is requisite to burn clay to afford the alumina. Mr. Spence also exhibits some zinc cement or hydraulic mortar, the precise properties of which we were not able to ascertain. In the same case are also shown, by Messrs. Tennant, Clow, and Co., salts of copper, zinc, and tin, potash, soda, &c., used in calico dying and printing. This is a branch house of the great concern of Tennant and Co., of St. Rollox, Glasgow. The latter not having sent any specimens to the Exhibition, we shall here notice the same through their Manchester representatives. Although not in the Catalegue, there may be seen in the same case glass jars, containing samples of garracine or subitan, probably unknown to our readers. Madders are well known, and have long been used as the source of Turkey red dyes. Up to a recent period, the remainder of the madder, after infusion, was thrown away. It has, however, been found that a large portion of the colouring matter of madder remained in this refuse combined with lime. It ingeniously occurred to a Frenchman, we believe, that, by applying sulphuric acid this hitherto fixed colouring substance would be set free; the result proved the correctness of the supposition, and what was thrown away previously is now of equal value as a dye with the madder as originally imported. The salts of copper manufactured by Messrs. Tennant, Clow, and Co. are procured in a different manner from those obtained by Messrs. Pontifex and Wood. In the case under notice, old copper sheeting, &c., is subjected to the action of fire in a reverberatory furnace, which converts the metallic copper into an oxide, on which sulphuric acid will act: after such treatment the liquor is crystalised in the ordinary mode in cisterns or vats lined with lead. Messrs. Tennant and Co. manufacture about eight tons per week in this mode. The salts of soda shewn are the ordinary carbonates of soda, respecting which we shall have more to state at a future period. The salts of potash are principally interesting for some splendid specimens of chlorate of potash. The zinc salt is the sulphate, and the tin compound consists of chloride and stannates, We feel much surprised at the circumstance that the chloride of lime is not shewn by this house, as they are the largest manufacturers in the world. Adjoining the specimens shown by Messrs. Tennant, Clow, and Co., is a model apparatus exhibited by their intelligent manager, Mr. James Young, intended to display his patented method for obtaining the stannate of soda. Stannate of soda is not novel to the calico printers, it having been manufactured for some time by other processes. Previously, however, to the improvement of Mr. Young, the stannates were formed from metallic tin, which was oxidised by different modes for the purpose. The ingenuity of this invention consists in subjecting tin ore and soda, or potash, to a high heat, by which means the requisite combination is formed. The stannates are used in dyeing steam colours. Mr. Young has also shown a bottle of mineral oil from a coal-mine in Derbyshire, which is found to be the finest lubricant for machinery yet discovered. Adjoining this is a sample of paraffine, formed by subjecting coal to a low heat, an inspection of which is well worth the attention of those engaged in the conversion of peat to economical purposes, for in all the commercial statements hitherto made on this subject, paraffine is set down as an important item; we are, however, informed by Mr. Young that it can be produced from coal in any quantity. On inquiring in other quarters, we are given to understand, also, that paraffine is not, nor likely to be, employed extensively for any economic purpose.

Case 9. Kurtz and Schmersahl, Manchester.—Several new colouring matters for printing and dyeing cotton, linen, silk, and wool, with specimens. Their new dyes are principally formed from various woods, extracted by means of alkalies; also some ultramarine, of various qualities. We feel somewhat surprised at there being so few specimens of ultramarine exhibited; nor have we seen any good specimens forwarded from Germany, which is the more surprising as Nuremburg is so famed for its production. Ultramarine, formerly made from lapis lazuli, previous to the introduction of the factitious mode of manufacture, used to be so high priced as four and five guineas per ounce; an equal is now produced for two shillings and sixpence per pound: the beautiful blue papers used by druggists, perfumers, and bookbinders are coloured with this material.

Case 10. Howard and Kent, Stratford, Essex, the celebrated preparers of fine chemicals.—Bottles containing quinine and chinconine (the active principles of Peruvian bark), accompanied by an assortment of raw materials, and various salts and compounds; specimens of the *Nectandria radiæi*, or greenheart bark, and its alkaloid liberine, a very bitter substance. To detail the various other preparations and chemicals would be, in fact, to give a list of the articles in a druggist's shop.

Case 13. W. Moberley, Mulgrave Alum-Works, Whitby.—Here are to be seen raw alum shale, calcined shale, alum meal, and finished alum; sulphate of magnesia, rough and refined, and the ammonia phosphate of magnesia as a manure.

22. F. C. Hills, Deptford.—Nitrate of potash, made by a patent process, consisting of the double decomposition of muriate of potash and nitrate of soda, which is thus converted into nitrate of potash, saltpetre, and muriate of soda (common salt).

31. Cheshire, J., Jun., Northwich.—Specimens of best table and other salt: this appears to be the representative of the immense annual wealth derived from our salt-mines.

39. H. Hopwood, Richmond, Surrey.—Fine piece of mannate of sugar of milk.

42. W. Lindsey and Co., George-street, Glasgow.—Specimens of Prussian blue and yellow and red prussiate of potash. The prussiates of potash are formed by fusing horns, hoofs, &c., of animals in a thick iron pot along with potash; by which means a compound is formed, called ferro-cyanite, or prussiate of potash, which, when mixed with a free salt of iron, forms the well-known pigment, Prussian blue: it is extensively used in calico printing. In various cases are exhibited splendid crystalline specimens, of different fanciful forms.

48. W. Watt, Glasgow.—A sample of sea-weed (*Fucus bulbosus*), with its chemical products; viz. kelp, sulphate of potash, chloride of potassium, carbonate of soda, iodine, and iodide of potassium. The manufacture of kelp was a most important art in the Western Highlands and Islands of Scotland, and along the coast of Connaught, in Ireland. Previous to the introduction of the manufacture of the alkaline soda, by the decomposition of common salt with sulphuric acid, as much as 25,000 tons were annually manufactured, worth from £8 to £10 per ton, containing on an average only five per cent. of carbonate of soda, for which it was purchased by the soap-boilers, the remainder of the substances being thrown away. At present, commercial carbonate of soda, containing 80 per cent., can be purchased for £10 per ton. The manufacture of kelp consequently languished for many years, until the the substance iodine was found so valuable. On an average, each ton of kelp contains four pounds of iodine: but to make a ton of kelp, 30 tons of dried sea-weed are required. The sea-weed so collected is burned, and the ashes kept stirred in a fused state until it presents the appearance of the sample exhibited. By various means of great ingenuity, the iodine is extracted. The price of iodine has ranged from six shillings to forty shillings per pound: it is at present worth about fifteen shillings. It forms a beautiful blue with starch, and crimson with mercury. The fumes are of an exquisite violet hue.

52. Brarly. W. A. Douglas, Isle of Man.—Refined oil and pure oleine, for watches, clocks, chronometers, and other fine machinery. The value of such a lubricating substance is well known to those engaged in the construction of time-pieces.

59. M. H. Piceivth.—Some gum-arabic bleached by a patent process, and sample of ultramarine blue.

70. J. Fisher, Madely, near Shiffnal.—Bisulphuret and chloride of carbon. The former substance is now extensively employed as a solvent for india-rubber; for which purpose it is prepared on a large scale, especially in the vicinity of Birmingham and Wolverhampton, in which neighbourhood it is also much used for gilding and electro-plating. It dissolves phosphorus very freely, which solution is used to give a thin film of that substance to delicate articles intended to be coated with metals—being first dipped into the solution and then into a solution of silver or copper, by which a film of the metal is produced on the surface; upon this other metals can be precipitated by voltaic influence.

71. S. H. Godson, Tenbury, Worcestershire.—Native mineral waters, concentrated and tested to show their bromine constituents. Bromine is found in all mineral waters. In consequence of the increased demand for bromine, owing to its extended use in the preparation of Daguerréotype and other plates, for taking portraits, &c., its economical preparation has become of some importance.

86. W. Robertson, Banff, Scotland.—Cod-liver and skate-liver oil, extracted by steam heat, manufactured at the various fishing villages on the coast of the Moray Frith.

92. A. Tilloch, Waltham Abbey Powder-Mills.—Prepared materials for gunpowder. There has also been forwarded from the Waltham Abbey Mills a very tastefully got-up design, composed of a box lined with sublimed sulphur, enclosing the representation of a cave made of fused saltpetre, which latter encloses a small beehive of sublimed sulphur. At the back are the letters "V. A.;" over this is the Prince of Wales' feathers, and in the upper compartment "V. R.," and a crown of sublimed sulphur, surmounted by a wreath composed of saltpetre. The appearance of the whole is very pleasing.

94. J. H. Kent, Stanton, near Bury St. Edmunds.—Dried pharmaceutical indigenous plants in glass vessels, with extracts. The plants are admirably preserved.

105. C. M'Culloch, Covent-garden Market.—Dried English and American herbs and roots. These are well worth attention.

107A. T. Keating, St. Paul's Churchyard.—Jalap, saffron, kousso, or *Brayera anthelmintica*, from Abyssinia; matico, or *Piper angustifolium*, from Bolivia. These are rare drugs.

138 and 141 inclusive principally contain pigments, and tools for their application, with varnishes, &c. Amongst the rarer materials is the white oxichloride of lead, as a substitute for white lead: there are also several specimens of *cudbear* prepared from orchil, a weed which is much used to give a bloom or finish to silks.

143—Jellarshall Lud—is a valuable collection for study, consisting of samples of indigo, carmine, orchil, cudbears, lac dyes, turmeric, and specimens of 36 kinds of European and native manufactures of lac dye in India.

145. W. Denteth and Co., Manchester.—Ornaments of crystals of bichromate of potash and nitrate of lead, with mineral colours, and used by calico printers and dyers, china and earthenwares manufacturers. The chromates of potash are made by calcining chromate of iron obtained from India, America, and the Shetland Isles: from these salts the fine yellow pigments are made, known as chromes. The process is a simple one; viz. the admixture, in combining proportions, of nitrate of lead and chromate of potash. Chrome salts are most extensively used in dyeing yellow, and chromic acid is used to dispel colours. A beautiful green—the green oxide of chromium—is prepared for pottery and other uses.

BOOKBINDING.

(SECOND NOTICE.)

IN one of the divisions at the extreme south of the space allotted to France will be found the contributions of the French bookbinders. We are sorry to say, that, at present, only two or three of the best class have set out their cases, though several other names of repute are included in the Exhibition Catalogue. M. Gruel first claims our attention for his two large volumes bound in morocco, inlaid with coloured leathers, forming very bold and good designs; and for a missal in velvet, richly ornamented with gilt metal and jewels: but commend us more to some smaller books of "Hours," one in carved ebony, one in velvet, covered with a tracery of ivory, another in bright velvet with a beautiful design in carved box-wood; and to two or three other volumes in russia and velvet slightly ornamented with metal hinges and clasps of exceedingly graceful ecclesiastical design, very different from the ill-formed and heavy Gothic patterns to be found on our English bibles. In the adjoining case M. Niedrée exhibits the perfection of workmanship in delicate gilding. There are two tiny volumes of this collection that may challenge the world for their superior. M. Niedrée seems to prefer spending his chief talent on the inside of his covers; and on one of these little volumes especially there is the most exquisite design, most ably executed, For honest bookbinding, without the factitious aid of metal-work carving or inlaying, M. Niedrée clearly, in our opinion, bears the palm; and a refined taste will, perhaps, be better pleased with this little show of volumes than with all the glories of their more magnificent-looking

brethren. M. Simier sends a "Don Quichote" bound in light calf, with a good ornamental design darkened upon it, and as a centre the celebrated wind-mill; and a "Molière" decorated with a Grolier pattern: his other specimens are not to be praised. Mame and Co, the great publishers, of Tours, exhibit a variety of cloth and Morroco bindings, which we are sorry we cannot commend: in general the ornamentation is gaudy and ill-designed. Parisian taste does not seem to extend much through the French provinces.

In the Northern Gallery, over those courts appropriated to Belgium, M. Hanicq, of Mechlin, exhibits a trophy, as it were, of Liturgies in various languages and all sizes, some of them illustrated and illuminated, and nearly all bound in a showy way with stamped metal corners, clasps, and ornaments. The first impression promises something worthy of praise, but we are sorry to find that a closer inspection dispels the illusion.

We must now descend the stairs and enter the room in which MM. Leistler, of Vienna, display their beautiful bookcases: here we shall find some marvellous examples of Austrian work.

Commencing at the left-hand side of the Gothic bookcase, we must first admire a folio volume, bound in blue velvet, ornamented with silver tracery of a rich Gothic design. In the centre is a figure of Christ, and at the four corners are the symbols of the Evangelists—an angel, a lion, a bull, and an eagle—all in silver. The next is an album, likewise in blue velvet, ornamented with gilt metal and tracery of ebony (beautiful in design); the centre has a bronze medallion, set round with a string of pearls. The third is a large volume in green morocco, inlaid with red and buff leather, ornamented with gilt metal-work, enclosing ten medallions, painted like bas-reliefs, in metal. Next is a large and beautiful book, entitled "Landschaften," bound in purple velvet, exquisitely ornamented with pierced ivory of most elaborate pattern. Then there is a volume of "National Musick," covered with metal-work and carved ivory. In the centre are the arms of Austria; and, surrounding them, fourteen little oil-paintings, mostly of rural costume, descriptive, we imagine, of the national songs. Next is a book in morocco, inlaid with ivory and a light blue enamel, beautifully ornamented with gold; and, behind it, a volume bound in tortoiseshell, with gilt and silver ornaments of Gothic design, and three female allegorical figures in metal. These books must claim great attention and admiration for the elaborate and costly ornament upon them. They are—with the Gothic bookcase that holds them—a present from the Emperor of Austria to her Majesty. We have our doubts as to whether all the credit is due to Vienna; more especially as some plain morocco books in the same case do not exhibit the same amount of taste or excellence of workmanship: anyhow, here we find them, and *our* poor binder's court turns pale at the sight of such splendid book-ornament. Among the minor volumes we noticed a peculiarity not unpleasing: the titles of the books are lettered in raised metal letters, chased or burnished on the surface.

Now we must walk to the end of the Building, and on our right we shall find some specimens of bookbinding from the United States. And, for our dear cousin's sake, the less we say of it the better. It is not what we might expect, that among all their "wonderful" specimens of this art, of most of which an ordinary country bookbinder in England would be heartily ashamed. The only books that are well-bound and bound in character are the ledgers! The rest are wretched affectations. One man seems to think sunk panels the only merit, another gives us the lamentably perverse Gothic window on the side of a bible, and all agree in trumpeting their fame (?) as though they were to astonish the world.

COLOUR-PRINTING.

IN the same court in which M. Gruel and the other French bookbinders display their art, will be found some interesting specimens of lithographic colour-printing, by the well-known firm of Engelmann and Graf. A view of the "Parthenon," and a "Caravan in the Desert," are excellent; and their imitations of French drawings of various missal and other book illuminations (in ink printing) are very elaborate and good: but we must confess that, knowing their resources, we anticipated a richer show than Messrs. Engelmann choose to give us. M. Simon, of Strasbourg, exhibits some very clever scientific pictures of the glaciers in the Alps, and a few good landscapes. This gentleman has invented a new process, which he calls *lavis aquarelle* (water-coloured wash), which our English lithographers think an important discovery, but which they cannot use on account of the patent for their lithotint, taken out a few years since by Messrs. Hullmandel, who produce effects in monochrome by the same means that M. Simon employs in his colour pictures. The great merit of of M. Simon's plan is to obviate the necessity of so many printings. M. Silbermann, also of Strasbourg, sends a few good examples of colour-printing from wood blocks, and two or three sheets showing gradation of colour most admirably rendered. This, the great difficulty with wood-blocks, M. Silbermann seems to have overcome entirely. On the wall, close by, there are two imitations of bas-reliefs for paper-hanging, produced by wood-blocks by Delicourt, which are praiseworthy; but we cannot commend his large wall-picture, the "Death of the Stag." Further on is a better attempt of the same kind, an "Italian Garden," contributed by Mader *frères*, but even this is not excellent. In the north gallery, M. Jacqmain, of Ghent, sends a volume, "Lettres Initiales,' well printed in chromo-lithography, but the designs are too wild and fantastic; and M. Jumar, of Brussels, contributes some coloured coats of arms and priests' vestments, printed with blocks. One of the courts devoted to Austria contains little else than the productions of the Imperial Government Printing Establishment, at Vienna, specimens of types in every language, stereotypes, books, &c. Among these we find a very interesting collection of colour printing (lithographic) executed by M. Hartinger, expressly for this Exhibition. There are six examples—two flower pieces, a fruit piece, a study of a head, a picture of still-life and a *genre* picture, representing the Emperor Joseph II. prescribing 100 ducats as medicine to a poor widow dying of hunger. The original paintings are hung side by side with these remarkable productions, and we must confess, we had, at four feet distance, some difficulty in deciding which were the copies. A prospectus tells the visitor that each painting cost £25, and each copy 1s., but does not inform us how this last sum is calculated. There is much skill shown in the execution of these works: the deep tones of the flowers and fruits are well rendered; and though we find a little coarseness (almost inseparable from chalk-printing) when we examine closely, we must say that M. Hartinger is deserving of very great praise for these admirable specimens of his art.

Since our last visit to the so-called Fine Art Court (it is almost a Refuge for the Destitute), we find Messrs. Rowney have contributed a frame containing eight examples of colour-printing, too excellent to be passed by. The most important is "The Origin of the Guelph and Ghibelline Factions" (a lady, of course), lithographed in colours by R. P. Noble, from a water-colour drawing by F. R. Pickersgill, A.R.A. For boldness of execution and breadth of effect, this surpasses any work in colour-printing that we know: it is not finished like Mr. Brandard's copy of Frederick Tayler, and it will not bear close inspection; but, taken for what it is—a free translation of a clever water-colour sketch—it is very excellent. "Westminster Abbey" and "Claines Church," after R. P. Noble, are not deserving of so much praise. We like Mr. Richardson's "Lake of Lucerne" better; and better still, the copies of a pair of round drawings by J.H. Mole, and the "Fisherman's Daughter," by W. Lee, and "The Gleaners," by W. A. Robinson. In the same court we likewise find a large print, a "Village Girl," drawn and lithographed in six colours, by Mr. J. R. Dicksee, from the press of Messrs. Hanhart. This is a very clever production. The flesh tints are exceedingly well given, and we cannot but admire the subject. We recommend those of our readers who wish to decorate their walls in a tasteful and inexpensive way to visit the Fine Arts Court, and select, to their own taste, some of these newly invented pictures. For a time they can astonish their friends, who will believe they have "run mad" in the purchase of so many first-class water-colour drawings.

THE UNITED STATES GOVERNMENT AND THE EXHIBITION.—We are pleased to learn that the Secretary of the Interior has commissioned one of the agents of the United States Executive Committee at London, Charles F. Stansbury, Esq., to make a report of all those matters connected with the Industrial Exhibition which may be calculated to enlighten us on the present state of the mechanical arts in Europe. The report will be published under the direction of the Commissioner of Patents; and, from the known taste, industry, and ability of Mr. Stansbury, will be well calculated to promote the cause of science and diffuse valuable information among our own people.—*New York paper.*

DAWSON'S AUTOPHON.

Mr. Dawson's Autophon, which is simply a modification of the ordinary church organ with the addition of a pair of rollers, between which the perforated card-boards or milled boards containing the tunes to be played are introduced, is placed among the pianos and other musical instruments, in the middle north gallery. The perforated sheets of music having been introduced within the instrument, by the operator turning a handle with his right hand, pass underneath the various pipes through which the wind from the bellows is forced. The bellows and pipes are, of course, differently arranged from those of an ordinary organ. The unperforated parts of the boards serve as valves to shut off those pipes that are not required in any given tune.

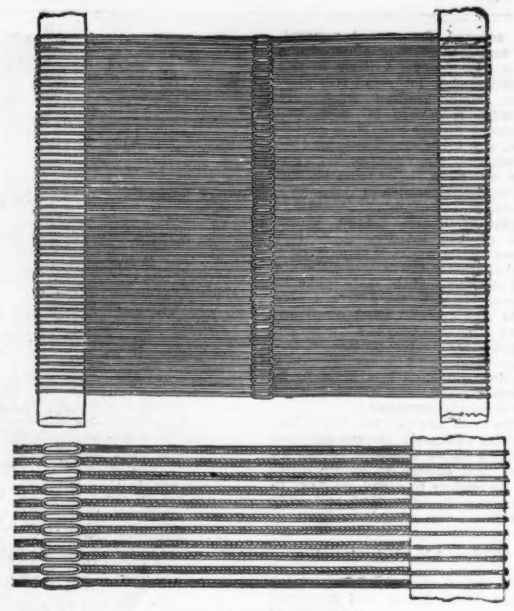
A great advantage of this instrument is, that the tune may be in any key, and not limited, as in the case of the barrel-organ. The operator is also enabled to dwell any length of time on a given harmony. In many rural districts, especially where the annual stipend of a professed organist is a barrier to the introduction of an instrument of the usual kind, Dawson's Autophon will be found to be a great acquisition.

JUDKINS' HEALD MACHINE.

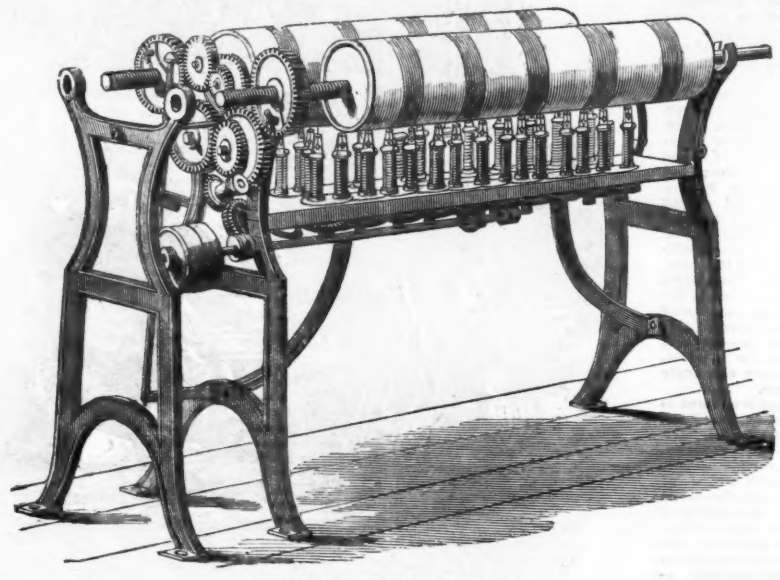
Mr. Judkins, the inventor and patentee of this useful machine, formerly lived at Sowell, Massachussetts, U. S., but has now taken up his residence at Manchester, in which important town his machine will no doubt be duly appreciated. By this machine, the yarn is doubled and twisted from single of itself, and at certain intervals is braided or plaited, so that the eye or loop of the heddle is formed without knots of any description, the whole forming one continuous line or cord.

The cut represents a set of healds, as made by this machine, with the eye or loop complete: this eye is coated by means of a metallic substance, which forms also a novelty in the invention.

The bed-plate is placed horizontally between the ends of the light iron frame; on each side of the bed-plate, and let in flush with its upper surface, are ten revolving tables, each table having six slots, the use of which is to receive the spindles carrying the flyers and bobbins. The tables work together in pairs, and each carries three spindles, which are so set in relation to each other, that each spindle, at proper intervals, comes opposite to the vacant slot in the other table. After being twisted the yarn is taken up from the bobbins, after undergoing the process of twisting so as to be converted into a heddle, by two



JUDKINS' HEALD MACHINE.



JUDKINS' HEALD MACHINE.

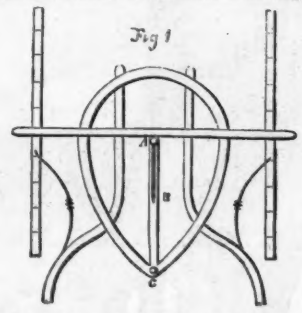
cylinders, one on either side of the machine. The working shaft of the machine is connected with the revolving tables by means of bevelled wheels working underneath the bed-plate.

The machine acts as a doubling and twisting machine, except at the time when the eye or loop of the heddle is formed, when at the top and bottom of each loop it becomes a braiding machine. The bobbins, during the operation, pass from one table to another throughout the whole series in a most ingenious manner. In order to show the advantage of this machine over the ordinary mode of making healds, it is only necessary to state, that from 25 to 30 sets may be produced by it in one working day, with the attendance of one girl, who, by hand, could only make a single set in the same time.

MIDDLETON'S CENTRIPETAL WHEEL-PLATE.

Among the various improvements in carriage building which may be seen in the department specially appropriated to the display of pleasure

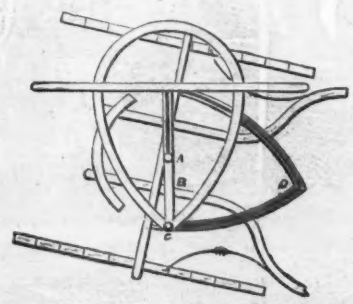
Fig 1



MIDDLETON'S CENTRIPETAL WHEEL-PLATE.

carriages in particular, and which is situate on the north side of the western part of the nave, and contiguous to the railway department—is a contrivance of the Messrs. Middleton, for lessening the draught of car-

Fig 2



MIDDLETON'S CENTRIPETAL WHEEL-PLATE.

riages, and shortening the lock—two important considerations, which have at different times attracted the attention of some of the first builders. It has been considered that a sliding perch bolt, as connected with the wheel plate, would certainly be better than the fixed one in ordinary use. Yet it is a matter of considerable difficulty to keep the "under carriage" always under the centre of the body, which is a serious objection, as, if the carriage is curved away from the centre, it not only makes it very difficult to look round, but renders it liable to accident from being overturned, owing to a want of sufficient bearing.

By the accompanying diagrams—1 and 2—it will be seen that the inventors have overcome the difficulties alluded to. A plan of the carriage, as it would appear when running in a straight line, is shown by Fig. 1. Thus, the wheels are brought much closer together, as the under carriage is full 10 inches nearer to the centre of the body than usual.

The carriage is shewn on the "full lock" by fig. 2, when the bolt A has been moved down the full length of the groove B, being guided both smoothly and equally by means of the pin C running in the groove D of the transverse plate, thereby allowing the wheels to work under the body.

The elliptical form given to the wheel-plate is both novel and ornamental, and the whole arrangement seems calculated to ensure ease and safety.

THE TUNIS COURT.

THE Tunis court or bay, of which we have given an Illustration on page 494, is the first on the right hand after passing through the iron gates at the south entrance. In front it is the width of a single division; but in the rear it is more extensive. The collection of Tunisian productions which have been sent for exhibition by the Bey of Tunis, under the care of Sy Hamda Elmkadden, pro-commissary appointed for the occasion, and Moses Santillana, interpreter to his Excellency General Sidy Mahmoud Benyad, the Bey's commissioner, are more remarkable as matters of curiosity than for their intrinsic value or importance. The most striking features in the outward show are some carpets, rugs, and blankets, and a variety of singularly-fashioned garments, for male and female, of a mixed material of silk and worsted, and of all shades and mixtures of colour; caps of various denominations—calabash, orta, sake, majidia, kaleb-shed, &c.—turbans, and other head-gear; silk scarfs; in short, an endless stock of gentlemen's and ladies' "left-off clothing"—just such a stock as one might expect to see in a native old clothes' shop at Algiers or at Cairo. Two hats of gigantic proportions, in red morocco, will astonish all beholders. In the inner room are others of similar dimensions, but made of straw, and ornamented with leather patches. The shoes, boots, and slippers, of red, green, and yellow morocco, well deserve the attention of the curious, as also some very substantial saddle-bags, of the same material, which, divided in two, might form very serviceable packs for a walking tour in Wales or Switzerland. Then there are samples of seeds, of saffron, of indigo, and glass jars full of sweetmeats, which last named the good-natured Turk in charge very freely dispenses, with wild gestures of welcome, to gaping juveniles as they pass. Arms and gun-locks of clumsy make are displayed in another compartment; in another various articles for domestic use, made of iron, tin-leather, and pottery, and of very primitive fashion; squares of "household soap," some candles also, veritable "dips" of a dirty brown colour. In another we have musical instruments, including a lute and a timbral; and strewed about in all directions are skins of animals, dressed and undressed; pieces of matting, parasols, fans, ornaments in gold and silver; claret-bottles, filled, some with scented waters, some with Begia snuff; and all sorts of odds and ends, mostly of the rudest description, but all admirably calculated to afford illustration of the *ménage* and *convenances* of the North African tribes. A tent made of camel's hair cloth, which stands in the middle of the room is a perfect picture, low, dark, dismal—a mere shelter for the mountain wanderer from the blast and the rain; in which saddles, saddle-bags, leather water-bags, leather bottles, leather mus, clumsy arms, and other articles for immediate use,

and adapted for prompt removal, are scattered about in admired disorder. In strange contrast to this tatterdemalion lot stand two glass cases, which contain some very splendid specimens of gold embroidered dresses and horse caparisons, and other articles of *vertu* selected, probably, from the Bey's private collection. Nor must we omit to address attention to some very curious models of arabesque carvings in gypsum, intended for the decoration of the interior of Moorish rooms. The workmanship is of a bold character, the devices elaborate and pleasing, and the material being pierced through, must have a very light and graceful effect when applied to the purposes intended. Preparatory to the process of carving, the gypsum is enclosed in a wooden frame, with a back to it, which supports and protects it till the design is completed.

We must now quit the Tunis bay and its extremely picturesque and obliging native *custodien*, hoping we have said enough to induce many of our readers to spend an hour in exploring its diversified and truly novel contents, as we have done.

THE CANADA COURT.

A HUNDRED years ago, supposing a great international and industrial exhibition to have been possible at that time, Canada would have furnished a very different assortment from that with which she now presents us. Then we should have had a rude and miscellaneous lot of native manufactures and native finery, something after the fashion of that now collected in the Tunis bay—a wigwam, some wooden or horn spoons, rough earthen pots, a few embroidered mocassins, a few tomahawks, and a dozen or so of scalps and other military trophies; but nothing indicative of the natural resources of this vast and almost virgin tract of territory, nothing that spoke of the honest industry or intelligent enterprise of its inhabitants. Very different from this, however, is now the case. Civilisation has begun its useful work in the far west; European industry has planted the spade there, and some of the fruits are now before us—speaking much and creditably for the past, but speaking still more cheeringly of what is yet to come.

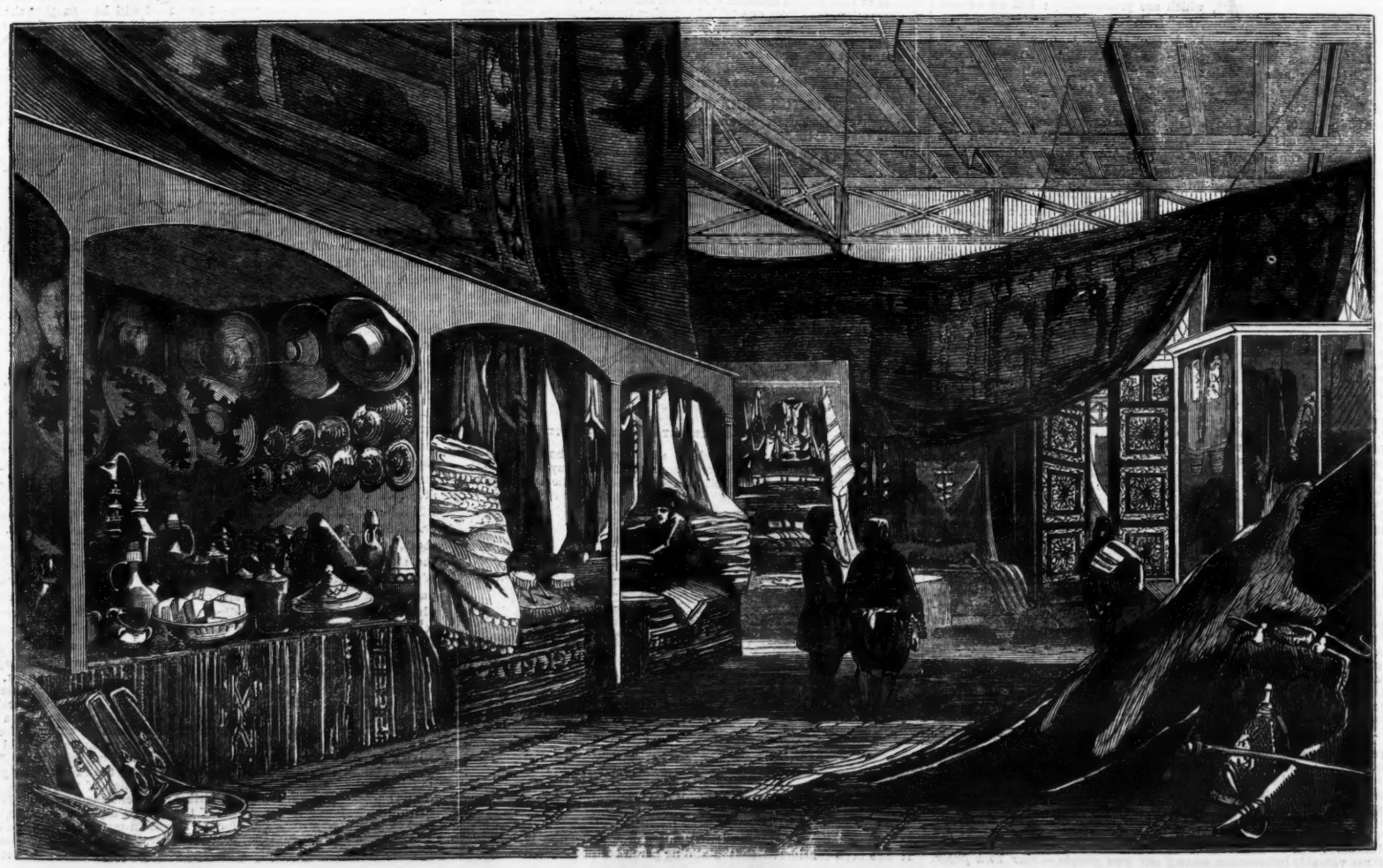
The Canada division is situated to the south side of the Western Nave, next beyond the East Indian division. Its products are not so showy, but are yet more valuable as evidences of social wealth and social advancement. They are the spoils of peace, not of war, the industrial beginnings of a junior branch of the great civilising family of the universe, not the gaudy remains of an effete barbarism, which has been demolished, but not yet replaced by anything better. The Canadians send us abundant samples of natural wealth drawn from the bowels of the earth—specimens of iron, copper, and silver ore, besides a case of native gold obtained from the gravel on the south-east side of the prolongation of the Green Mountains; specimens of magnesite rock, of stones of fine quality for the purpose of lithography, of agates, soapstones, gypsum, slates, and serpentines. Of timber there is a large assortment (the major part forming a large pile in the midst of the main avenue)—oak, curled ash, bass-wood black walnut, pine, curled maple bird's-eye maple, hemlock, elm, spruce, &c., all fine specimens, and of which the black walnut struck us as especially beautiful, both for its colour, its rich and varied grain, and the high degree of polish of which it is susceptible. The maples also are extremely rich, and, as well as the black walnut, are well adapted for furniture and other decorative works. Of agricultural products we have numerous samples, the Canadian exhibitors evidently attaching a due importance to this branch of their national wealth: barrels filled with corn, Indian meal, barley, oats, peas, beans, flax, potatoes preserved for sea voyage; with Siberian oil-seed, hemp, hops, and sugar from the maple tree, all show the varied richness of a land which, put to good account, might effectually relieve the distress of the older communities of the world.

Lastly, in unmanufactured, or but partially manufactured, products, there are specimens of moose hide and leather, moose deer's head and horns, calf-skin, porpoise-skin, &c.

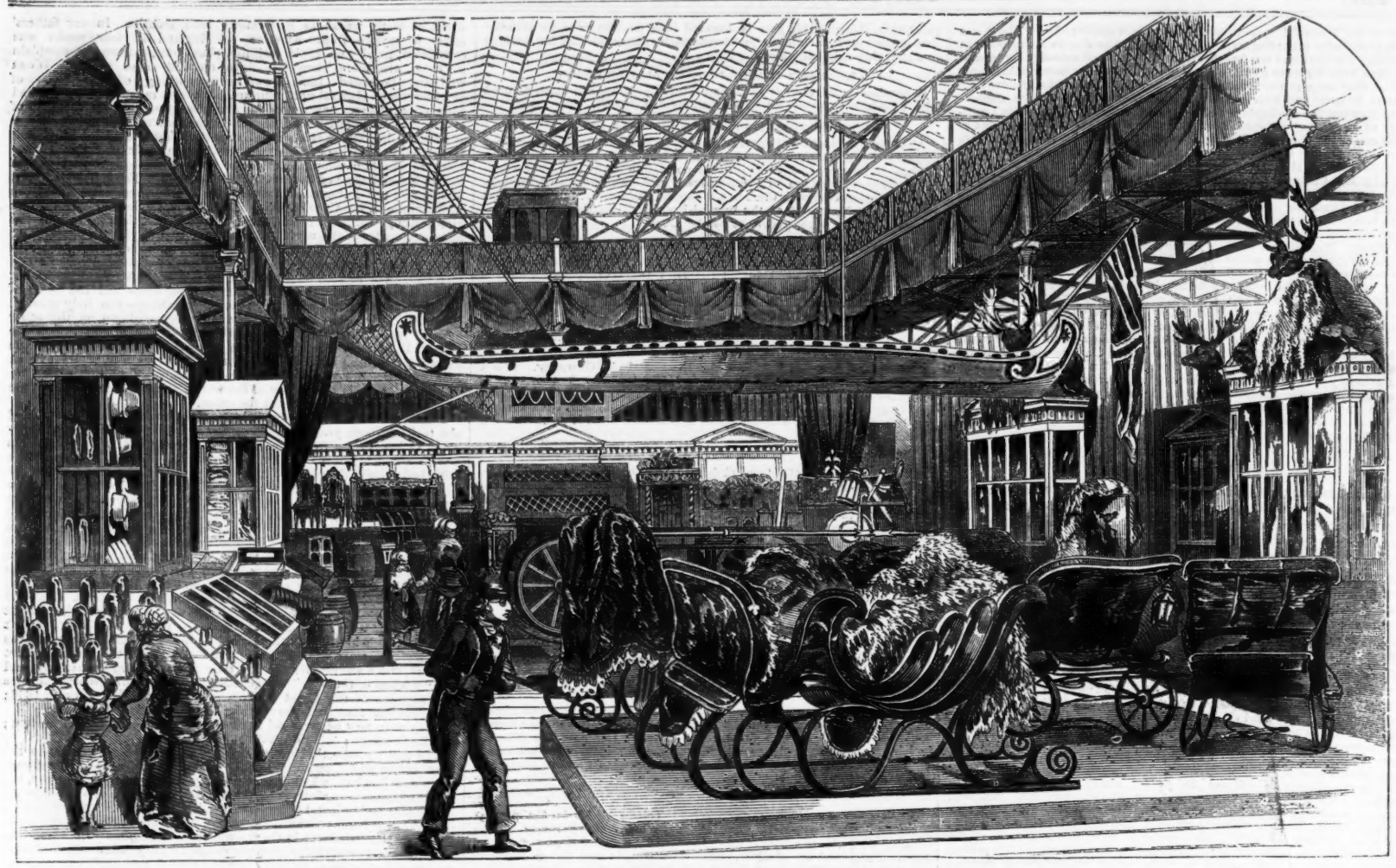
In addition to these resources of natural wealth, the Canadian colonists are favourably represented as regards their skill of handicraft—particularly as relates to furniture and articles of domestic and general use. Of furniture there are several most creditable specimens—substantial in make, whilst aiming at some trick of style in decoration, which, although of course not claiming to compete with the more finished and artistic articles of *luxe* produced in London, Vienna, and Paris, show an aptness of handling, which a little study of improved models, abundant opportunities for which the present Exhibition affords, will doubtless, in future, direct more happily. Amongst the articles of furniture deserving of especial mention, from the loyal associations connected with them, are half-a-dozen chairs, the seats and back worked in worsted and silk by the ladies of Montreal, "for England's Queen." There are also a handsome pianoforte and some other musical intruments, showing that Saxon industry in Canada does not intend to restrict itself for the future to mere articles of utility.

In the midst of the room are some very stylish sleighs, with harness and sleigh-robes complete; and a fire-engine of unusually large proportions, and remarkably elegant design and workmanship, capable of throwing two streams of water 156 feet high, or a single stream 210 feet high. There is attached to it a box containing necessary tools, and with a seat for the accommodation of the firemen; but this adds greatly to the length, and,

THE TUNIS COURT



THE TUNIS COURT.—GENERAL VIEW.



THE CANADIAN COURT.

although a useful contrivance for the comparatively open thoroughfares of Montreal, would hardly do for the crowded London streets.

Amongst other matters which the visitor will remark in this collection, are some interesting models, including one of a wooden bridge, having an arch of 250 feet span; a Canadian trading canoe, made of course of bark—a remarkably fine specimen of this class of boat; ship-building crooks and futtocks; specimens of cordage; various tools and articles of cutlery; samples of carpeting, blankets, and grey cloth; fine cloths and satinettes; patent leather trunks, bound with brass ribs, and remarkably substantial; cooking and parlour stoves; a church bell, made from the copper of Lake Huron; some excellent printing types; a new description of copying-press; snow-shoes and mocassins; and even some articles of jewellery and some specimens of artificial teeth.

MINERAL MANUFACTURES.—THE BUILDING COURT.

ONE of the most interesting, and in a social point of view, one of the most important branches of the Exhibition, is that of the mineral manufactures of Great Britain and Ireland (Class 27), in a compartment sometimes known as the "Building Court." The progress made in the working and application of the numerous beautiful natural stones with which these islands abound, and also the ingenuity displayed in the manufacture of artificial stones, bricks, and tiles, both for roofing and flooring purposes, are alike creditable and pleasing in their results.

Of the natural stones, of which specimens fashioned in a variety of forms abound, may be mentioned the granites of Cornwall—the serpentines of the Lizard district, together with porphyries, stealites, and some other varieties from the surrounding districts—the marbles of Derbyshire in great variety of texture and colour, from the pale encretical marble, to the fine black marble—vases of fluor spar, a very scarce variety locally known as "Blue-John"—the green Connemara marbles wrought into table-tops; tables of serpentine marbles from Ballynahinch Quarry, Galway, on pedestals of black Galway marble; others of red and white marble from Churchtown, county Cork; granite from Woodend Quarry, near Blessinton, Ireland; slate slabs from the island of Valentia; besides specimens of the more commonly known Bath oolite and Portland stone, and of Caen stone, and some other foreign varieties. Many of these are applied to very beautiful subjects, some of which may be enumerated: a granite obelisk and base, 20 feet high, of Cornish granite, by Hosken, of Penryn; a baptismal font, vases, and other cabinet specimens of serpentine stone from the Lizard, by Organ, of Penzance; a sepulchral monument of the decorative period, in Caen stone, by Brown, of London; a baptismal font in Caen stone, richly sculptured with sacred and devotional figures, by Margetts, of Oxford; a statue of St. Peter, in a canopied niche of Caen stone, a very fine piece of workmanship by Lane and Lewis, of Clifton, near Bristol; various articles manufactured by the aid of steam machinery at the Derby Marble and Spar Works; ornamented specimens of Galway marbles, by A. M'Donald, a self-taught artist, &c.

Amongst the artificial products, Minton's encaustic tiles, and the ornamental bricks and tiles, for walls and decorative borders, by Bowers, of Tunstall, Staffordshire, are exceedingly beautiful, the colours and designs equally striking and in good taste, and for villa architecture would be highly appropriate. Mr. Hunt, in his Synopsis of the Exhibition,

THE BUILDING COURT.

says of the beautiful specimens of tesseræ here displayed:—"These are now principally manufactured by compressing the clay in a dry state in moulds; the particles are forced within the limits of cohesive force, and are thus kept together by the operation of this power: being afterwards baked, they acquire the firmness of stone, and are excessively durable." Messrs. Francis and Sons exhibit a large specimen of interior decoration, showing the applicability of their new cements to produce imitations of marbles of various kinds, and also of scagliola compounded of their cement. The enamelled slates from the Pimlico slate-works are also very pleasing additions to our decorative resources; and the same may be said of the patent mantel-pieces, made entirely of glass and iron, by Mr. Coates, Singer's patent mosaic pavement, of highly vitrified coloured glass, and Harland and Fisher's new method of imitating marbles by painting upon glass.

In terra-cotta we are struck with several very beautiful productions, more especially a stove for a church, designed by Pugin, and executed by Messrs. Minton and Co. Of inventions of a more utilitarian character we are happy to notice several improvements in bricks and tiles for cottage architecture, eminently calculated to improve in healthfulness and comfort the houses of the humbler classes. A prominent illustration of the application of these new principles is afforded in a design for cottage architecture, exhibited by the Society for the Improvement of the Dwellings of the Poor, in which a new description of hollow brick is used, which, besides the advantages of increased durability as to texture, affords easy means of ventilation, all that is necessary for that purpose being the insertion of a grating in an orifice made in any part of the wall. The applicability of these new bricks to roofing, without the aid of timbers, on the principle of the arch, braced with a single tie of iron, is also illustrated in the model before us.

We shall devote a separate paper to this interesting and important subject on an early occasion.

ANATOMICAL MODELS.

Grouped among the Surgical Instruments, in Section 10, are some contributions of anatomical models, a department of art which, from the extensive collections in Italy, France, and Germany, has been supposed to be exclusively confined to the Continent, but which some of the specimens exhibited on the British side will show to have advanced to a high degree of perfection in this country. The materials of which the models are principally composed are plaster of Paris painted, *papier maché*, gutta percha, and wax; and the subjects which they illustrate are dissections of the human body—some few morbid specimens—and the anatomy and development of several of the lower animals. With the exception of an interesting series of the anatomy of the male and female torpedo in wax, presented by the Grand Duke of Tuscany to Professor Owen, and deposited by him in the College of Surgeons, we have not recognised any striking display of talent on the Continental side. The magnified models of gutta percha, &c., which take to pieces and show in successive layers the deeper parts in the organisms they demonstrate, however ingenious and amusing they may be, have no pretensions to a high, and far less the highest, order of anatomical modelling. The French exhibit a variety of these; and a full-length anatomical figure in *papier maché* and gutta percha, with a section of the human head, is shown by Mr. Simpson. Our attention, however, has been arrested by some very striking wax models, by Mr. Towne, whose experience and skill are well known from his works at Guy's Hospital. He appears to have selected some of the most intricate and difficult dissections, and to have displayed the several structures with a rigid regard to truth, which challenges the severest scrutiny of the practised anatomist. This is obviously the case in a model of the head and neck, with a deep section of the brain, in which there is not only a most valuable piece of anatomy in the relative position of the muscles, blood-vessels, and nerves of the neck, and the distribution of the great nerve of sensation, known as the fifth nerve; but there is also a minute dissection of the internal ear and the orbit, which exceeds any that we have yet seen, in delicate, yet perfectly clear and accurate modelling. An arm at full length, with the corresponding side of the chest, exhibits the minute distribution of the nerves, with the arrangement of the muscles, blood-vessels, &c. A very beautiful and complete series of the changes which take place during incubation in the chick is also shown, and the same subject is illustrated by an exhibitor from Newcastle. The latter artist has tried to unite natural structure with his models, but with no more than the usual success of such incongruities. A case filled with some small models of the heads of the great divisions of the human family affords an interesting subject for examination, and a felicitous reference to the extent of race, which is included in the purposes of the Exhibition.

THE ENGRAVINGS.

1.—SIDEBOARD. BY LEISTLER.

This very stately piece of furniture stands in the Austrian Court. It is extremely richly carved: the lower portion exhibits branches, covered with grapes and other fruits, crossing and twining in the boldest manner. The wood, however (from South America), being of a dark hue, and strongly veined, somewhat interferes with the effectiveness of the design. Above, on either side, are two magnificent candelabra, in or molu.

2.—DOOR-KNOCKER. BY FEETHAM.

Quaint in design, and boldly carried out. The introductoin of living animals, the dog open-mouthed, and the snail, especially the latter, may be questioned.

3.—SCUTCHEON AND HANDLE FOR DRAWERS. BY FEETHAM.

In the Elizabethan style, elaborately chased, and very effective.

4.—SILVER GROUP OF SIR ROGER DE COVERLEY AND THE GYPSIES. BY JOS. ANGELL.

An agreeable composition, well grouped, which sufficiently tells its own tale. The design was modelled by J. Henning, jun., and does him great credit.

5.—CANTERBURY. BY JENNENS AND BETTRIDGE.

An elegant production in *papier maché*, richly emblazoned with mother-of-pearl: a highly creditable specimen of our resources in *articles de luxe*.

6.—SILVER INKSTAND. BY MARTIN AND CO.

The design for this inkstand—represented as a thistle—does not strike us as a very happy idea, whilst the introduction of hooks or rests for the pen upon the stalk is decidedly an addition not found in nature: the execution, however, is highly satisfactory.

7 AND 8.—CANDELABRA. BY SUSSE, FREERES.

Two very pretty productions in bronze; the figures being well designed, and gracefully draped.

9.—THE DREAMER'S CHAIR. BY JENNENS AND BETTRIDGE.

This is another of the rich and fanciful articles of furniture in *papier maché*, exhibited by Messrs. Jennens and Bettridge. The devices, as may be observed, are emblematic of repose profound, and the chair has a most comfortable and inviting appearance. The colours, however, of a pale cold hue, are hardly to our liking, as connected with snug parlour uses. The design is by Fitzcook.

10.—TIARA. BY BOUILLETTE AND CO.

This is a very showy sample of imitation diamonds, applied to head decoration; a branch of light and inexpensive jewellery in which the French unquestionably excel.

11.—CLOCK. BY R. AND J. MOORE.

A large and showy clock, elaborate in internal workmanship and outward decoration. It goes one month, chimes the quarters on eight bells, strikes the hours on a cathedral-toned bell, and plays twelve tunes, shifting, by the action of the clock, to a fresh tune every hour. The frames of the dial and the steel plate upon which the clock stands, are enamelled upon a new principle. The base is carved in walnut wood. The design of ornamentation is of rather a mixed character, and perhaps a little redundant; but, altogether, for general purposes, it may be pronounced rich and effective.

12.—THE KOH-I-NOOR. EXHIBITED BY HER MAJESTY THE QUEEN.

This Engraving represents the Koh-i-Noor, or Mountain of Light, once the property of Runjeet Singh, now exhibited by her Majesty, and which, for the purpose of better inspection, is mounted upon pillars, within a gilt iron cage, prepared for the occasion by Messrs. Chubb. The machinery connected with it is so arranged, that, at the close of each day's exhibition, this valuable gem is lowered into an iron case for security during the night. Below the jewels themselves are exhibited the settings in which they originally stood.

13.—SILVER CLARET JUG. BY LIAS AND SONS.

A handsome jug, ewer fashion, and somewhat classic in form, covered with vine-leaves, grapes, &c. Designed by J. Fitzcook.

14.—THE KOH-I-NOOR, IN ITS ORIGINAL SETTING.

As matter of historical interest, we give another Engraving from a painting by a native artist of the Koh-i-Noor, as it appeared in its original setting, when it came into the possession of the British Government. The settings are of green enamel, and, as above stated, are preserved in connexion with them in the Crystal Palace. A full description of the Koh-i-Noor, and of the Durra-i-Noor, will be found in our Supplement for May 17th, under the head "Gems."

15.—JASPER DISH. EXHIBITED BY THE EAST INDIA COMPANY.

This very unique and beautiful production, which appears amongst many other articles of value in the East India Company's stand, is formed of a single plane of jasper, of a heart shape, of about the size of a dessert-plate or dish. It is elaborately inlaid with gold, and set with rubies and other precious stones.

16.—THE DURRA-I-NOOR; OR, SEA OF LIGHT. EXHIBITED BY THE EAST INDIA COMPANY.

This splendid gem is exhibited by the East India Company. It is a table diamond, of a beautiful quality and of immense value, surrounded by other smaller ones, and once the companion of the Koh-i-Noor. Our Engraving is taken (as in the case of the Koh-i-Noor) from a painting by a native artist, and shows its appearance when it came into the British possession.

17.—SILVER TEA AND COFFEE SERVICE. BY SMILEY.

These are very beautiful and elaborate works, the designs, which are all punched and richly chased, representing the various stages in the culture and preparation of the tea-plant. We hardly approve of the taste shown in the introduction of the figures of her Majesty and Prince Albert as ornaments or handles to the lids.

18.—PISTOLETS D'HONNEUR. BY DEVISME.

A pair of very handsome pistols, inlaid with silver, presented by the permanent commission of the provincial press of France to General Changarnier. They are highly decorated in the arabesque style, and are made by Devisme.

19.—MIRROR SCONCE. BY THE COALBROOKDALE COMPANY.

A very pretty and effective production for room ornament—the design somewhat antiquated—in cast iron, bronzed; and, like everything coming from this quarter, beautifully turned out.

20.—INLAID TABLE-TOP. BY VALLANCE.

A very brilliant sample of workmanship. The table slab is of Derbyshire black marble, and is inlaid with groups of flowers in various coloured marbles, serpentine, lapis lazuli, &c. The character of the different flowers is admirably distinguished; and the intricacy of the workmanship may be judged of from the fact, that in some of them as many as a thousand pieces of stone have been used.

21.—TOLEDO SWORD.

There are two specimens of the famed Toledo blades in the present Exhibition, that which we have engraved being the property of Don Manuel de Ysasi, to whom it was presented by General Espartero. The hilt and scabbard are of silver, richly ornamented; and the remarkable elasticity of the blade is put to the test by the circular arrangement of the sheath, which actually rolls it up as it receives it.

22.—EBONY AND BOXWOOD FRAME. BY W. G. ROGERS.

A very light and elegant production; the boxwood scroll-work boldly pierced, and richly carved and finished, standing over a background of ebony.

23.—ELIZABETHAN BRACKET. BY W. J. ROGERS.

A remarkably fine specimen of wood-carving. The material is box; the devices are bold and in high relief, the masks and strap-work being magnificently cut.

24.—SPECIMEN OF PAPER-HANGINGS. BY SCOTT, CUTHBERTSON, & CO.

A very handsome specimen, with graceful plan of lines and harmonious colouring.

25 AND 26.—SILVER WINE FLAGONS. BY LAMBERT AND RAWLINGS.

Two noble flagons, in form after the fashion of the old camp-bottle, decorated in the *rénaissance* style, in silver parcel gilt. Just the sort of thing to grace the table of an old baronial hall, on a birthday or other family anniversary.

27.—STAMPED LEATHER ORNAMENTS. BY LEAKE.

This group contains several examples of the use of stamped leather in the decoration of rooms, and the manufacture of picture-frames, medallion brackets, and other descriptions of ornamental work to which composition is generally applied. The designs are abundant in variety, and many of them of very pleasing effect.

28.—ORNAMENTAL VASE OF SEVRES CHINA.

A very noble production in this unrivalled branch of manufacture. The groundwork is of the beautiful pink colour for which Sèvres china is so celebrated, and the figures are incrusted upon the material beneath the enamelled surface. Produced under the direction of M. Regnier.

29.—POROUS POTTERY FROM MADRAS.

Our Engraving represents two beautiful specimens of porous pottery from Madras, exhibited by the East India Company. Their forms are extremely graceful, and the hue a delicate yellow.

30.—CEILING ORNAMENT IN PAPIER MACHE. BY BIELEFIELD.

One of many very pleasing samples of the application of *papier maché* to ceiling and mural decorations.

31 AND 32.—EBONY TABLE, INLAID WITH SILVER, WITH VASE. BY HANCOCK.

This is one of the most elegant and classical works of decorative furniture in the Crystal Palace; an ebony table, inlaid with silver, in the pure Etruscan style, surmounted by a silver vase of exquisite beauty.

33.—SILVER BELL—THE FAIRY SUMMONER.

A very pleasing device, and appropriate to the use to which it is applied—a lady's hand-bell. Here is represented the fairy Puck, summoning the spirits from afar to do her bidding.

THE WORLD'S HIGHWAY TO THE WORLD'S EXHIBITION.

There is no other country under the sun from which the invitation to the nations of the world to exhibit productions of their industry could have proceeded with so much grace and propriety as England. With the exception of the United States of America, no other country has sought to imitate, far less to rival, the efforts of England to establish regular and rapid communication between all parts of the globe. Had any of our Continental neighbours issued such an invitation, it must have been borne to the ends of the earth in English steamers, and visitors would have voyaged to it in ships sailing under the English flag. The mighty task of bringing all the nations of the world nearer and closer to each other has been, as if by tacit consent, left to be accomplished by English skill, ingenuity, and enterprise; and as by us the pathless tracks of ocean have been converted into grand highways for "joining the countries they divide," so the terminus of all these great highways has been, without dispute, selected as the most fitting place for the exhibition of the world's industry.

This is a fact, that, in after times, when the historian comments on the events of 1851, will be considered as of great significance. If the Crystal Palace be, in its extent, symmetry, materials, and the rapidity of its erection, one of the greatest wonders of the age, a greater wonder is that vast and comprehensive system of communication with all countries, without whose agency it would have been utterly impossible to have made the arrangements for the Exhibition even in double the time that has actually been required. The day has not long gone by when the voyage to China and back occupied nearly as great a length of time as the interval between the announcement and the opening of the Exhibition; but now, letters are forwarded to China in about as many weeks as it formerly took months. In our fathers' days, a voyage from America to England in four weeks was considered good and rapid sailing; but now, passengers complain if they are more than ten days on the same voyage. When we first possessed India, we knew nothing of the deeds of our Governors' General until four and often six months after they had been done, whereas now scarcely six weeks elapse between the date of an event in India and its notification in the London papers. A change of ministry in London is known all over the West India Islands in about three weeks; and honourable members rise in their places in Parliament to question colonial secretaries about disturbances that only a month before happened at the Cape of Good Hope. From Buenos Ayres, Valparaiso, the Isthmus of Panama, the West Indies, New York, the Mediterranean, the Cape of Good Hope, India, Ceylon, Singapore, and Hong Kong, the lines of communication all meet in England as the focus and centre of the world. From these highways, steamers bearing "the meteor flag of England," are never absent, not now freighted with death-giving weapons and death-seeking men, but with merchants and merchandise of nations long hostile to each other, but now met together with the same object—the interchange of good deeds and the fruits of each others industry. This gigantic undertaking—this holy mission, in which England has no rivals, save her own children on the other side of the Atlantic—is represented only to the mind's eye in the Crystal Palace. To the spiritual eye only *can* it be represented, for the vessels engaged in it, if placed in one continuous line, would extend to about three miles; and the aggregate number of miles steamed by them every year in the service of the world, is more than six times the distance between the earth and the moon.

England built the Industrial Palace for the world in about a year, and she took thirteen years only to complete the system of ocean highways to her shores from the ends of the earth. Her first attempts were laughed to scorn even by her own philosophers. Nay, so little faith had men in the power of the steam-engine over the sea, that only about thirty years ago it was considered impossible to take a steamer from Greenwich to Belfast. So thought and said the wise men of that day, but a Glasgow engineer thought otherwise. He, however, said nothing, but engaged a berth on board a little schooner plying between Greenock and Belfast, that he might have a look at the kind of sea with which the steamer would have to contend. The weather was bad—the little schooner heaved and groaned amid the troubled waters; but the engineer kept his footing on the deck, watched the waves, asked all sorts of strange questions of the seamen, made calculations, scratched his head, looked thoughtful, and finally, with the quiet remark that "It can be done," went below to his berth. The sailors were not long left to conjecture what it was that could be done, for soon afterwards the smoke of a steamer was for the first time seen near the Straits of Port Patrick, and a steamer for the first time cast anchor in Belfast Bay, and the "wisdom of the wise" was confounded. Still more triumphant were the voyages of the *Great Western* and *Sirius* to New York in 1838; and from that time dates the opening up of these great highways.

They may now be arranged in three great groups:—1. The Eastern; 2. The Southern; 3. The Western.

The first includes the lines to Spain and the Mediterranean, to the East Indies and China. With the exception of the service between Aden and Bombay, which is performed by the East India Company, the whole of the communication on these Eastern routes is conducted by the Peninsular and Oriental Steam Navigation Company. They possess a fleet of twenty-five steamers, fourteen of which are engaged in the European, and the remainder in the Asiatic seas. The history of this company affords a remarkable example of the rapidity with which British energy and enterprise, aided by British capital and skill, can conceive and execute the most gigantic schemes. It is only fifteen years ago since the operations of the company were limited to the conveyance of the mails between England and the Peninsula—a service performed with six times the rapidity, many times the regularity, and at a less cost to the nation, than under the old system of sailing-packets. Instead of voyagers having often, as under the old *régime*, to

> lay
> Till the day,
> In the Bay of Biscay,

they were carried across that rough and stormy part of the Atlantic with a speed that greatly diminished both the inconvenience and danger. Lisbon, Cadiz, and Gibralter were brought within less than a week's sail from Falmouth; and British merchants could visit the vineyards and wine-presses of Spain and Portugal in less time than it once took to journey from London to Edinburgh. But the entrance to the Mediterranean was not long the terminus of this highway. As the capabilities of steam-ships were developed the demands on their services increased, and it was soon determined to extend them to our possessions in the East. The some company undertook to carry the watery highway up the Mediterranean to Alexandria; and the East India Company sent their steamers to the Red Sea and the Indian Ocean, to complete the track to Bombay. The old passage by the Cape of Good Hope, whose discovery by Vasco de Gama was one of the great events of the memorable fifteenth century, was abandoned to sailing-vessels, and at once the time occupied in the journey between England and India was reduced from four months to six weeks. The mouth of the Nile was visited by mighty steam-ships with a far nobler mission than the fleet of Nelson: if the "forty centuries" that, according to Napoleon, "look down from the tops of the Pyramid," could think, they must have thought that the passage past them of "the overland mail" with its letters, and newspapers, and passengers, was one of the greatest and best changes they had seen during their long contemplation of the land of Egypt; and the waters of the Red Sea were never so agitated since Pharaoh's host was drowned, as by the paddles of the steamers turning up its waters on their way to Bombay. But soon the same company had their vessels in the Indian Ocean also, and now they maintain a regular and uninterrupted communication with the East as far as Canton. The aggregate tonnage of the vessels of the company is nearly 30,000; the power which propels them is equal to that of 9000 horses; and the total number of miles steamed every year under the mail contract, for which £204,500 per annum is received, is not much under four hundred thousand. The same company send vessels at regular periods to Italy, Turkey, and up the Black Sea, as far as Trebizond. And all this has been achieved within the last fifteen years, by a joint-stock company of British merchants.

Thus, while England invites the people of the earth to the Exhibition of Industry in her metropolis, she, alone of all the nations, can say that she has provided a safe and speedy highway to her shores; that the Chinese can embark in English ships at Hong Kong; the Malay at Singapore; the Hindoo at Calcutta, Madras, and Bombay, the Cingalese at Point de Galle, the Arab at Aden and Suez; the Egyptian at Alexandria, the Circassian and Armenian at Trebizond, the Turk at Constantinople, the Italian at Naples, the Spaniard at Cadiz, and the Portuguese at Lisbon and Oporto.

In the second or Southern group of these great highways, England is also without a rival. The West India Company with a fleet of thirteen vessels of the largest class, to which five will soon be added, maintains a communication twice each month with all the islands in the West Indies, and with the chief ports of the Gulf of Mexico, as far north as Vera Cruz and Tampico, and once each month with the east coast of South America, from Bahia to Buenos Ayres. On the west coast another British company carries on a monthly communication between Panama and all the principal ports, as far south as Valparaiso; while a third company, also British, dispatches its steamers each month to the Cape of Good Hope, calling at the islands of Maderia and St. Helena and at Sierra Leone. The arrangements for these services are so complete and so regular, that there is no civilized inhabitant of South America, the West Indies, and the west and south coast of Africa, to whom these great highways are now open without distinction of country or of race. The establishment of this southern group has been the work of ten years only.

It is on the North Atlantic highway that Britain meets, not so much a rival as a coadjutor in her peaceful and gigantic labour. On this highway there are now running in the postal service of this country and the United States fourteen of the very largest steam-ships that have ever sailed on the ocean. Their speed is such, that the distance between Liverpool and New York is often steamed in about ten days. The line of British steamers has been established under the admirable superintendence of Mr. Cunard for about thirteen years, and the American line of Mr. Collins for about one year. The vessels of the former bear the names of the continents, of the latter the names of the oceans of the world. The "crack ship" of the Cunard line at present is the

Asia; of the Collins line, the *Pacific*. Both have made remarkably swift passages, and each succeeding voyage seems to eclipse all its predecessors. The rivalry of these noble vessels is a fitting accompaniment to the industrial rivalry of nations at the Great Exhibition. The prize contended for is the superiority not of mere brute force or stratagem, but of ingenuity and skill; not of the power of tyrannising over man, but of aiding and helping him; not of the power of exacting service from, but of rendering service to, mankind.

To how many unworthy doubts of the perfectibility of man is not the history of these ocean highways taken in connexion with the Great Exhibition a sufficient answer? The fact that England has within fifteen years perfected a system of ocean highways of more than 20,000 miles in length, and that these are now traversed by "men of all nations, and kindreds, and tongues," anxious to see and improve by the productions of the industry of each other, gives good grounds for the hopes of men the most sanguine, that the time is fast coming when the great object of the thoughts, desires, and labours of the nations will be to live in harmony, and to extend to every member of the human family the greatest possible share of the riches of the earth and the good fruits of the ingenuity, skill, and activity of man.

LETTERS FROM LONDON
ON
THE GREAT EXHIBITION AND OTHER MATTERS,
ADDRESSED TO HIS UNCLE ENOCH, HIS AUNT HULDAH, DEACON BIGELOW, AND OTHERS.

BY PELEG E. WHEELER,

Of Penobscot, State of Maine, U.S., member of the Penobscot Historical Society and Major of its Independent Corps of Boundary Volunteers,

WITH AN INTRODUCTION BY BAYLE BERNARD.

INTRODUCTION AND LETTER I.

SOME ACCOUNT OF MAJOR WHEELER, AND THE ARRIVAL IN AMERICA OF THE NEWS OF THE EXHIBITION.

It is now some dozen years ago, that, through the medium of a friend, I was so happy as to make the acquaintance of Major Wheeler, of Penobscot; and my satisfaction was increased, when the great project of the Exhibition numbered him among the thousands who resolved to visit England. The special object of his visit will be dwelt upon elsewhere, but one of its results was the desire that I should read his various letters dispatched to friends at home, in order to verify their candour; and as I must confess I was led to think they were of a nature to prove acceptable to a wider circle than his own, I asked his leave to make them public, a wish that I am bound to say was met in a spirit not less creditable to his modesty than to his frankness. Thus they are offered to the world; but—in order to ensure them that respect, and even sympathy, I think they merit—I feel it proper to introduce them with a few personal details, which may be referred to in solution of their occasional enigmas.

Major Peleg Wheeler, of Penobscot, State of Maine, was born on the frontiers of Vermont, about forty years ago; and, as the son of a thriving farmer of the old New England stock, enjoyed many of the conditions that develope active minds. With a pursuit that inspired industry and early self-reliance, he lived under a Government whose energizing freedom happily harmonised with nature's. But he was blessed with more distinctions: he could also boast of genius—a genius that dawned speedily, and in an unexpected form. Peleg Wheeler was a poet—not in a mechanic sense, an aptitude for rhyme or rhythm—his measure was Imperial Winchester; it invariably ran over, and his capacity for jingle never got beyond his "smilin'," "When the forest streams were bilin'," or his "Allers feeling sadder" "At the swiftly spreading shadder." He stood on higher ground; he possessed imagination, the motive force of poetry, whatever is its engine; and the evidence he gave of it formed a phase of some importance in the transatlantic mind.

We had come to the belief in Europe that that mind was all material. Deceived by the necessities of its juvenile development, we could perceive in it only a monstrous mal-proportion of the practical, which was speedily converting it into a Babbage's machine. It is true there were Western epics—the "Columbiad" of Joel Barlow, and the "Canaan" of Dr. Dwight: but we found in one a geometrician, with a true sense of length and quantity; and in the other a good psalmodist, who could put history into long metre. A poet was demanded to defend the Western brain—to show imagination neighbouring logic, as a sort of compensation balance. And at length a poet came. Need I remind the English reader of those strange and vivid fictions which so suddenly burst upon us about a dozen years ago, and which promised to repeat the wonders of the old Arabian Nights?—inventions so peculiar, and at the same time so felicitous, that we all felt them to be as new, as they were to some extent, inexplicable. When we read, for the first time, of that strange western El Dorado, whose fertility was so wondrous, that a crow-bar planted over night sprouted nails before the morning!—whose woods were so impervious, that the full moon could never rise through them; and whose odours were so strong, they could hang up a coat and trousers! And surrounding this Elysium, that as memorable desert, where the seed put in the ground was always bigger than the harvest!—where the cattle were so poor, it took ten pigs to make a shadow; and the water was so weak, it hadn't strength to run down hill! When we were also introduced to such new aspects of humanity; when they told us of a man so large, it took two pair of eyes to see him; and of another, who was so swift, that in running round a tree he caught a sight of his own back! I give these as merely specimens; but need I enlarge on their impression, the wonder they created, and the unanimous admission that America had at last displayed a true imagination!

Now, my reader may remember, that these fancies were supposed to be the common product of the country; that it was thought that its invention, being suspended by other faculties, had gone on silently augmenting, like subterranean water, until now it had burst forth into a fresh and graceful fountain; or, that it was a case of latent heat, which, evoked perhaps electrically, had exhibited the phenomenon of spontaneous combustion. I am happy in being able to put an end to these delusions, and to render to modest merit what it has never cared to claim. So far from these being a general, they were an individual product—were the offspring of Peleg Wheeler—who, being then in his youth, or about his six-and-twentieth year, adopted such a course as his first step to publicity.

The Major began life as a poet. But this may be the common case. Youth must always be ideal, from its excess of faith and wonder; but need I say, the mind is twofold—has a real side as well, and true development is to pass to it, being a principle of wholeness. Was our hero's an exception? No; the Major felt his age—its growing spirit of progress, and that the mission of all patriots was to unite in its sustainment. He saw that the public engine required increase of fuel, and 'twas his duty to give it speed, if not his glory to direct it. And, faithful to the poetic instinct, which must ever be affectionate, it was now his wish to serve, what he had already so delighted. Understand, then, his transition from the abstract to the concrete, from the ideal to the practical. See why he resolved to harness imagination to the car of science; to bid farewell to fiction, and pour his whole soul into action. Accordingly, migrating from the frontiers to the seaboard of New England, as affording in its commercial spirit a proper field for his exertions, he settled in the State of Maine, where he became a general storekeeper, and, in proof of his harmonic tendency, sold everything that was vendible, from a history to a hand-saw, and a blanket to a breadstuff. It was here that he developed what the Germans call a manysidedness; not only in his store, which he appropriately named the "Focus," but in his mind, which began to radiate into a dozen different studies, from law all round to literature, and pharmacy to politics. It was here that he gave birth to his mechanical inventions, which, if found to be impracticable, was only owing to the fact that they were so original in theory. And it was here, also, he confessed to an extended responsibility—that he married and connected himself with two important institutions. He became a member of the "Penobscot Historical Society," and an officer in its corps of independent volunteers; thus acknowledging a twofold obligation to the public—to serve it mentally and physically—to guard, as well as to guide it. Services how opposite, and yet how interfusing—how calculated to balance and complete the healthful mind!

It was in the midst of these numerous and valuable activities that the tidings reached my friend of our Giant Exhibition. Now, of all the Western intellects, his was, perhaps, among the fittest to appreciate its scheme, as it was certainly among the foremost to stamp it with approval. From one's country to humanity, the step is easy and immediate. It is but a widening of the circle which commenced with self-denial; and thus, as eagerly as he had sought to advance the interests of America, he now admitted the philosophy of serving all mankind. The result may be surmised. He resolved at once on a great testimony—to contribute to the World's Warehouse one of his principal inventions; and, as I have stated, that, some years previously, he and I had become acquainted, one of the first steps he adopted was to favour me with certain letters, which I shall now lay before my reader, and then add such other matter as may be essential to my purpose. His first letter was as follows:—

"*The Focus, Penobscot, State of Maine.*

"OLD ACQUAINTANCE!—

"Well—now if this ain't news! Jess spell it; jess be good enough to say if it aint a sample of first chop, or a cork that's got the crust on! If it ain't as good as the Deacon's eye-snuff that he recommends for meetin'—a sutbin' to button back the eye-lids, and keep a man from winking. Why, I can scarsly believe it yet! can't help thinking we're all dreaming—that the toddy was too stiff, and we've got up afore our brains were dusted. It's too good a thing for truth! too lovely by a long chalk. Looks like Natur in a pictur; not what Natur is, but jess what Natur ought to be. I swallow'd it at first as if it had been a pint of my own brandy (and that's the best imported), and there I stood with my head whirlin', and my eye-balls in a blaze, like a couple of small farmaments that's shot with summur lightnings. The Hull World's Exhibition! Humanity's grand warehouse! the common counter—Loft and Show-room of the univarsal human race! Well, I wouldnt' have believed it, if it had been sworn by all the judges; but as I've read it in the papers, of course I know it's true. But jess sum it up a moment; jess consider what's its total. Why not a fraction less than this—univarsal peace and concord! All that Elihu Burritt talks about, and whose scheme I never keer'd for, because it's only talking. Nothin' short of all our spesby going to London to shake hands, and say, instead of fighting, they mean to work and talk, and trade together. That's its size if anything. There's an eend to war and glory; that's as sartin as the school-tax. Now the plan will be to fill the world, and not to try to empty it—to turn cannon into ingins, and swords and bagnets into rails, and say that iron shall connect men, and not sarve to part and splinter 'em. So marsy on the sogers! Now they'll have to arn their livin', and how in Natur will they do it, unless they take to stoking; and that seems natral sartainly, as their trainin's to stand fire? Marsy on 'em all! for as sure as Sabbath mornin', we shall say good-bye to gunpowder—the old world's motive power—the fine old force of history—to scatter brains and savings with. I reckon ourn's a better one, to send goods about, not bullets, and strengthen brains, not scatter 'em!

"It's the jam! and that's a fact; and that aint the hull tote nuther. It's a downright Chiny puzzle. Some wonders are like currants, they allers come in clusters. Jess to think we owe this notion to good old Daddy Bull! That *he* should preach up quiet with all his arsenals and dockyards—with his ships that say "Good morning" to the sun all round the globe, and his cannon poking out from half its headlands, like so many devil's telescopes, through which Satan squints at misery. Not that he loves fighting as badly as his neighbours—don't care to *dine* on glory, but he likes a relish now and then, and goes to work in Ingy, jess as if he were in Mexico. And yet now to be ashamed on it, to own it's all wrong and sinful, and to ask the hull world about him to jine in his opinion! Well, I swon if 'taint magnanimous!—if 'taint as grand as Mount Katardin. It raally makes one proud on him; tho' it's darn'd provoking too, for what are we to do, I wonder. We've been accustomed, as all the world knows, to beat Father Bull in everything; allers to go ahead of him, whether in schooling, arts, or politics; and what on airth's afore as now? No beating him on this track, even if we open shop ourselves, and ask Europe, Ashy, and Afriky to come over and see *us*, unless we could get 'em all to stop with us—and perhaps that aint quite impossible, and not a bad idee!

"But jess look at the fact a moment. Never mind who fathers it; look straight into its face, and see what's in its wrinkles. Aint it an answer to all the fellers that want us to go backwards, or only forard fast as oxen; that want to stick to the old tracks—the old rutty roads of history; and, instead of steam and iron, tell us to hold on to yokes and waggins? Don't this shut up their clam-shells? Ain't it a fact to prove our Ery? Don't it show that it's high pressure—that we're going at full bile, and can't allow of stoppages? As I said at our Society, on the occasion of my last lectur, "Ourn is "The Lightning Epoke." We are as swift, as straight, and fiery; and if obstacles oppose us—if any old tree comes in our way, stretching out its withered branches, or any poor, old, limping crittur gits across and thinks to stop us—there's nothing left but this: we must either go through or over 'em. But don't it prove, too, suthin' more?—that there's one great motive force for man—one univarsal biler; that along the great line of progress, one family has been appointed to do the work of toting, and that's us, the Angler-Saxons? Ain't we the special ingin, built to put the world in motion; to grip the hull train on 'em—trucks, cattle-pens, and carriages—and take 'em up the slant jess as easy as a hurrykin will tote a field of haystacks? Look at our pace already: ain't it the quickest upon airth? Don't we beat all living people at any notion they've a mind to? Don't we think quicker, and work quicker, walk, talk, eat, drink, and sleep quicker? And if now and then we die quicker, why, I reckon, that's on principle, jess to set a good example, and keep the growing folks in temper.'

"Well, and now as to partikelars. I s'pose you'd like to know what stir the notion made here, and what's its present footin. Well, it didn't come in winter time. I guess the day it reached us, we gave a hurrah for Daddy Bull, that you might have heerd across to Liverpool. We sent it right away to sea, and if it didn't do the distance, 'twarnt no fault of ourn, I tell ye. And that done, we all set to work to make it travel round the country; and, as a sample of our doings, I'll jess speak about myself. Now I aint a sleepy man, you know; don't wear out many chair cushions, and mostly find the longest day won't more than roof my work in. Though I do belong to what they call the 'ruminating speshy,' can't say I've got its privilege—sunshine by the gallon, on the south side of a holler. I've got to chew my cud on eend. Sometimes think my legs are pend'lums, to set my clockwork going. Can't raally think I'm thinking, unless I see them swinging under me. Well, the first thing I did was to make my son Abiram, who writes a good, tall, walking hand, draft the news out on a sheet of paper, and hang it up in the 'Focus' winder; and, as the 'Focus' is pretty centrical, I thought that a good beginning. I s'pose you know what the Focus' means. If you don't, I'll jess explain it.

"I've told you afore now, that my principle is to balance things; that in all my work and dealins, I allers go for equal pressure; because I long ago found out that that's tantymount to progress. I larnt it when a boy, and used to take a spell at driving. I seed then what was the effect of letting the traces git oneven—a strain to come in one place, and no pull at all in tother; speshally on the shaft-horse, when, if the saddle warnt in the middle, slipp'd a grain on ary side, off went a hunk of flesh, besides a twisting of the withers. Now, you've heerd of my establishment—what we call a 'gin'ral store,' and that it aint one of the slimmest; nuther as small as a wicker bee-hive, nor as empty as a poor-box—a sort of place where you can buy everything, from a jack-knife to a julep, and a side of bacon to a satin ribbon; a kinder commercial cyklerpedy, for all sorts of human cravings, either to feed a man or kiver him. That's the truth, and nothin' over. But then, I say, hold on a bit; tho' it's full, it aint quite perfect; jess wants a little balancing. There's a mind inside the body, and my dooty's to line the one, jess as much as I do tother—to stiffen 'em out alike, in order to equalise the pressure. So, to carry out my principle—over the store I've got a noos room, where I take in all the papers, and a man may read and talk all day for the vally of a julep. And that's not the total nuther; even literatur is exciting—you may git too much of that. I don't keer as to your politics, High Tariff or Low Tariff, Slaver or Free-soiler, pro or anti anything; an hour or two's stiff talking will wring your head as much as rhumytism. So, to balance that agin, I've got nine-pins in my shed; and there a man may go and stretch himself, till his cocoa-nut is easy. Work his muscles for an hour, till he's rectified his brains. Now, I call that equal pressure—equal weight on mind and body; and, as it's all under one roof, I call my house the 'Focus.'

"Well, and now for my day's work. As soon as the noos was in my winder, I set off for the Town Council (s'pose you know I'm made a member), and called a speshal meetin' for ten o'clock next mornin'; and from there I went to Dr. Tucker's, the president of our Society, to get him to put aside his lectur' for the Wednesday night ensooing, and take this noos instead—(and his lectur' warn't a pocket un, chock full of arydishun: 'twas on the natur of anshent alligators, and whether they had tails at startin'. His notion being that they were a kinder turtle afore the Flood, but they got their tails into the currents, and so were lengthened out). And as soon as he said 'Yes,' I started for Deacon Bigelow's, to see if he couldn't improve the noos at class meetin' that evening; and then called round on Judge Burridge, to larn if it warn't possible to mix it up next day in his charge to the grand jury. But, as both on 'em were ruther duberous, I wouldn't lose no time, but run off to Joel Baxter's, to tie up threads with him. Now, of course you can't be ignorant that we've got a paper in Penobscot—the Penobscot *Star of Freedom*; and that it aint a second-class one, though, for the sake of condensation, it comes out but once a week. 'Taint one of the common fly-traps that's made up with paste and scissors; nor a literary save-all to catch the weekly drippings; nor one of your independent organs, that plays all sorts of tunes; but the honest representative of all our Eastern interests. And, of course, you know what *we* are—High-tariff men, the hull of us: High-tariff and Free-soilers—protection to native industry, and protection to God's produce—to His images, who've been robbed both of their bodies and their souls (and all because, poor critturs, their skins aint like a toolip); and there's no mistake in sperit, no compromise, I tell you. In carrying out our principles, we're clean meat-axe disposition; and you'll see the *Star of Freedom* aint under the top notch, when you know who are its writers. There's Uncle Enoch and the Deacon, Joel Baxter and the Doctor, Ezra Prentice and myself. Not a fraction less than six on us. So you'll acknowledge we're a team, to say nothing of the Doctor, who's a team and a spare horse. Well, I run off to Joel Baxter's, jess to settle this one point—who should make the noos a leader, for it warn't a common topic, one that comes to hand in packages, it was an article of vally, that desarved a first-rate workman: and I s'pose I needn't say we both voted for the Doctor; so Joel agreed to go to him, and then I streak'd for home.

"Well, and how did it all turn out? Well, town-councils, as you know, are allers ruther selfish—allers a sort of house-dog, who only bark round their own doors. So I expected nothin' much from ourn, and I can't say I was disappointed. We had a pretty good attendance; old Judge White was in the chair, and there was the sheriff and town clerk, and all the select men, past and present. Well, I moved the resolution, that we should testify our sympathy with the British public in the matter, and call upon the townsfolk to come forard and contribute; and Ezra Prentice seconded. Then came the opposishun. One said we war too poor to send; another, 'twas too far; and another, that, if we did send, it wouldn't be of any vally. Well, I easily answered them; but Judge White was of opinion that there was another knot afore us, that there was no planing down at all, try all we could to fix it. The Exhibition, as he said, was for national manyfacters, and the State of Maine 'raised nothin' but limestone, staves, and cod-fish. Now, there was an objection! Why, as I said to him at once—'If these things are split and salted, don't that make 'em manyfacters, say all you will agin it? Don't they call for skill and labor? and, even if they don't, there's no one will deny that they're the finest staves and cod-fish on the face of the hull airth!' And yet, would you believe it, after an argyment so conclusive, I only carried my resolution by a majority of one! Well, the Deacon warn't much better. He said, he thought the noos was too seklar for class-meetin'; and I found that the Judge sized him. He had to try a man next day for ill-treating his young daughter, and he couldn't see the connexion between the products of all nations and this product of Seth Byles. However, to make amends for all, the Doctor was stupendous! Whether in his lectur' or his leader, he was as good as a volcaner; he poured out a stream of fire, that shook and stunned and blinded us. It was agreed upon all hands, that he had gone round himself twice over; that he had capped everything on record; and retire when he might, the name of Tucker stood endorsed to the latest new year of posterity! I can only compare his efforts to two peaks of the Blue Ridge—jess as broad about the base, rising as grandly to the clouds, and minglin as finely all way up, nat'ral luxuriance and gin'ral cultivation!

"And now, as I've kivered all my paper, I'll tell you by the next ship how the notion went ahead.

"Yours always to command,

"PELEG E. WHEELER."

(To be Continued.)

THE HISTORY OF INDUSTRIAL EXHIBITIONS.

BY W. BLANCHARD JERROLD.

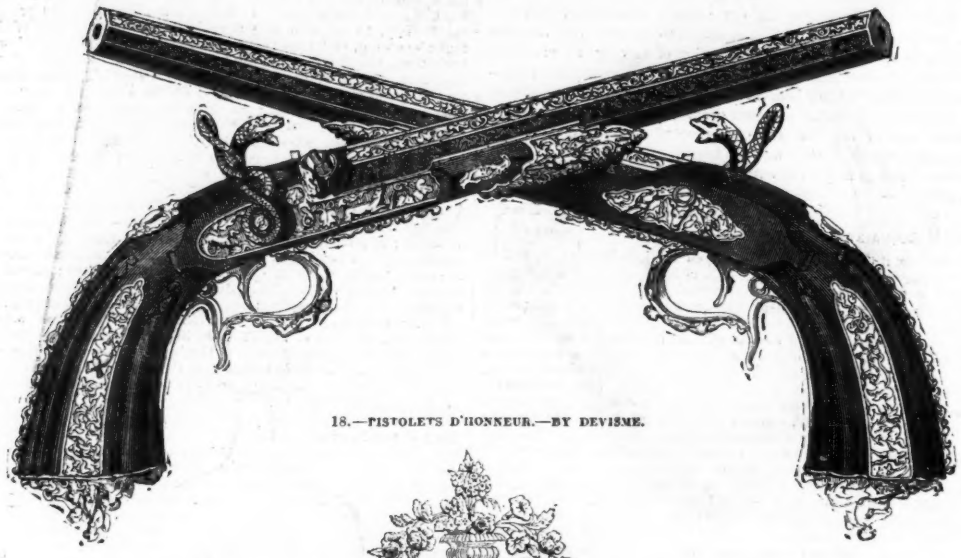
(Continued from page 461.)

CHAPTER VII.

THE EXHIBITIONS OF GERMANY.

The commercial history of Prussia since the Peace is too well known to the manufacturers of this country to need elaborate mention in a history of her industrial exhibitions. The gradual formation of that great commercial league which now binds Prussia, Bavaria, Wurtemburg, and other states of Northern Germany together, and gives them, commercially, one common interest, has so absorbed the attention of Europe throughout its progress, that its minutest details are familiar to all who have mingled in the world for the last thirty years. This great commercial confederation now indisputably ranks as the third commercial power of Europe, including vast agricultural and manufacturing resources. As a market for foreign manufactures, the states of the Zollverein are decreasing daily in value; and England, that, in 1813, inundated these provinces with the products of her looms, now finds the market which she then commanded threatened by native skill and capital. Skill is developing; capital is being concentrated. Factories of vast importance will soon concentrate the isolated weavers of Saxony and Silesia; and steam will do its full measure of work. The cheapness of raw material and labour gives Prussia advantages which she yet needs the sagacity and experience to turn to full and profitable account. The most important industry of the Zollverein is incontestably its wealth of wool and woollen manufactures. The cloths of Saxony, Silesia, and Prussia Proper command the markets of the East and the West, more, perhaps, from the excellence of their raw material than from any superiority in the skill of German weavers. The linens of Saxony and Westphalia have also an enviable reputation in the markets of the world; and in Berlin and Potsdam, silk manufac-

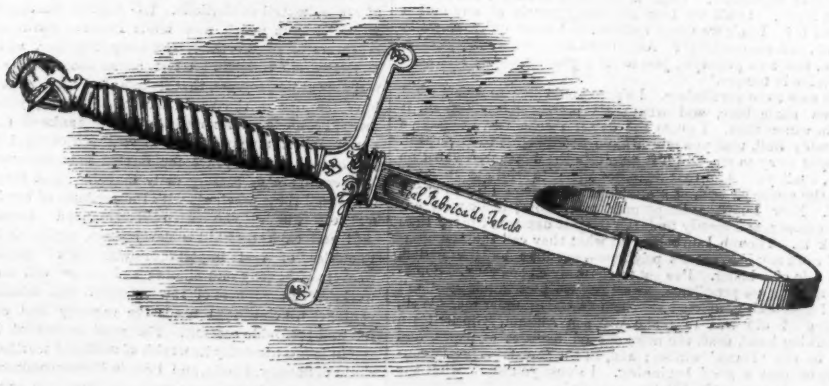
17.—SILVER TEA SERVICE.—BY SMILEY.



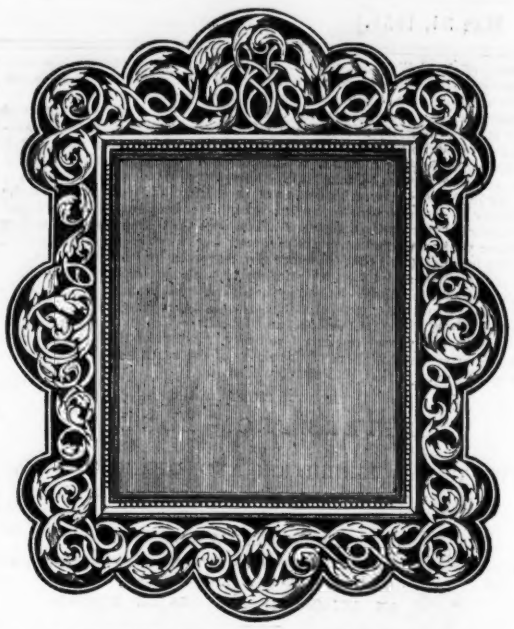
18.—PISTOLETS D'HONNEUR.—BY DEVISME.

19.—MIRROR SCONCE.—BY THE COALBROOKDALE COMPANY.

20.—INLAID TABLE-TOP.—BY MR. VALANCE.



21.—TOLEDO SWORD.—BY DON MANUEL DE YSASI.



22.—EBONY AND BOX-WOOD FRAME.—BY W. G. ROGERS.

turers are making rapid progress: these manufactures have figured at the Berlin exhibitions in considerable quantities. These exhibitions, comprehending specimens of Bohemian glass manufactures, Berlin iron-work, the porcelains of Saxony, and the iron ores of Silesia, have undoubtedly stimulated manufacturers to make those enlightened exertions

23.—ELIZABETHAN BRACKET, IN BOXWOOD.—BY W. G. ROGERS.

which have characterised the last ten years within the circle of the great commercial confederation.

The commercial policy of Austria, strictly and inexorably protective, presents a picture in direct contrast with those presented by the other countries whose industrial exhibitions we have noticed. Here corporations of trades and workmen are maintained with all the strictness

24.—PAPER-HANGINGS.—BY CUTHBERTSON AND CO.

which characterised those of France in the last and during the early part of the present century. All the great foundries and manufactories are government speculations; class is protected against class, and an impassable barrier of restrictive duties warns the foreign merchant from the Austrian soil. Yet even this country boasts its exhibitions of industry. Even here the principle of gathering together the products of

25.—SILVER WINE FLAGON.—BY MESSRS. LAMBERT AND RAWLINGS.

27. STAMPE LEATHER ORNAMENTS.—BY LEAKE.

26.—SILVER WINE FLAGON.—BY MESSRS. LAMBERT AND RAWLINGS.

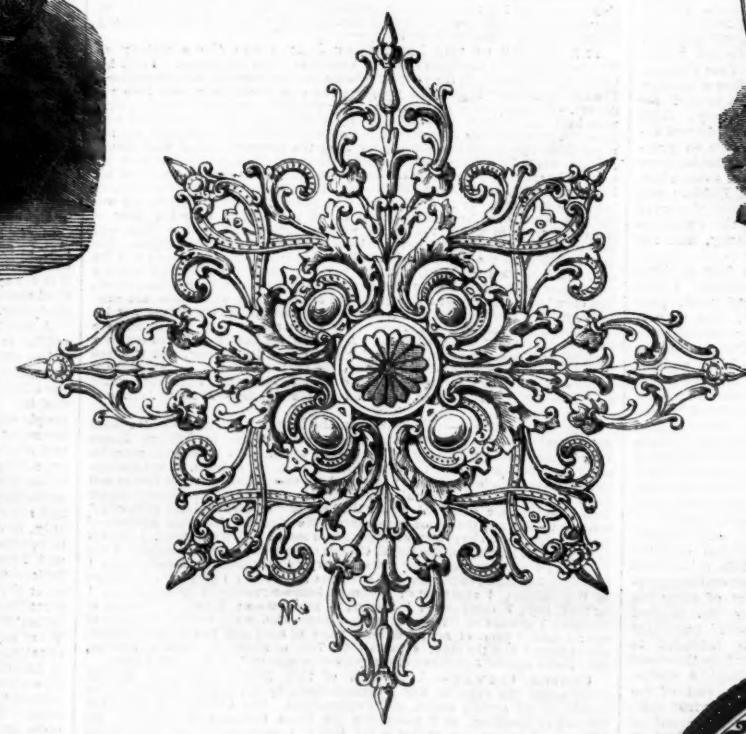
the country for the instruction of the community has been recognised and acted upon. The great natural riches of Austria are remarkable. She has abundance of combustible fossils; the simple evaporation of the waters of the Hungarian lakes furnishes her with vast quantities of soda; her alums may compare with those of Rome; no country is richer in salts, and these immense natural resources are neglected through the ignorance of Austrian chemists. The beet-root sugar manufactories of Moravia and Silesia, and glass factories of Venice and Bohemia, claim notice in the most cursory review of Austrian industries. The products of the Bohemian workmen have made splendid shows at the Vienna exhibitions, and have been contributed by the busy population of Wisental, and the great establishments of Gablonz and Liebenau. Venice, however, has fallen, under Austrian domination, from her ancient splendour, and has sent little or nothing beyond a few mosaics to the capital of her conquerors, on these occasions. At the last Vienna exhibition, Austria showed signs of progress, in the specimens of machinery exhibited by the Great Southern Railway Company. That these exhibitions, including examples from the shawl, porcelain, and great silk factories of Vienna, the velvets of Milan, and the light silk goods of Como, should have attracted particular attention, and proved eminently successful, is not to be wondered at, since they displayed at a glance the industrial power of a great country, crippled by narrow national views, it is true, yet in its bondage giving proof of its giant capacities. Already educational associations have been founded. Already the manufacturers of Vienna have established a society for the examination and encouragement of useful inventions. Already a Tyrolese society for the formation of an agricultural and industrial museum has been established. Already Trieste possesses a gratuitous school of arts and a savings'-bank.

In a brief record of the industrial exhibitions o Germany, the efforts of the King of Bavaria of that King who has so greatly adorned his capital—to establish permanent exhibitions of Bavarian skill, cannot be passed over. It was in 1845 that the first permanent building erected in any country for such a purpose was thrown open at Munich. The building is adorned with sculpture by Schwanthaler, and provides nearly two thousand square yards of exhibition space

The continental states, of whose industrial exhibitions we have given a brief history, can by no means claim, exclusively, the honour of having recognised the utility of these institutions; since industrial exhibitions have been held at various times, and with varying success, also in Italy, Sweden, and even Russia. Detailed accounts of these would, however, prove of little interest to the general reader, since they included, for the

28.—ORNAMENTAL VASE OF SEVRES CHINA.

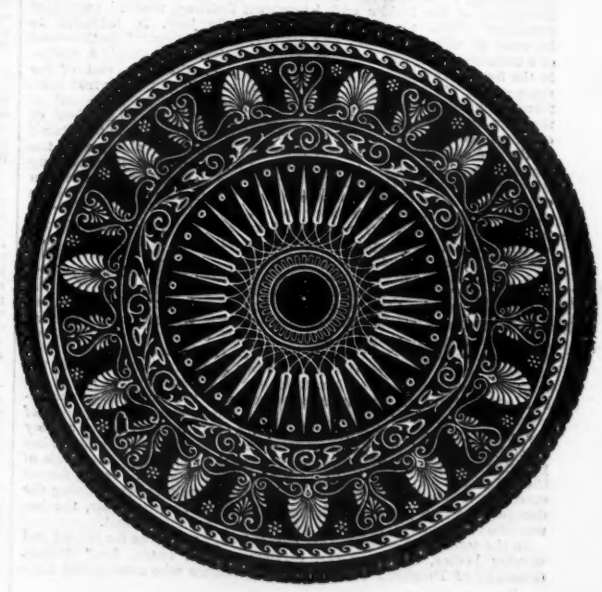
29.—POROUS POTTERY FROM MADRAS.



30.—PAPIER MACHE CEILING ORNAMENT.—BY BIELEFIELD.

31.—SILVER VASE, AND EBONY AND SILVER TABLE.—BY C. HANCOCK.

33.—THE FAIRY SUMMONER—A SILVER BELL.



32.—TOP OF EBONY AND SILVER TABLE.—BY C. HANCOCK.

most part, only specimens which, however excellent, when considered as native products, could not, of course, enter into competition with the more advanced manufactures o Germany, France, Belgium, and England.

CHAPTER VIII.

THE EXHIBITIONS OF IRELAND.

BRITISH manufacturers were almost the last in Europe to recognise the utility of industrial exhibitions. Even Spain had organised a national exhibition of industry, before even the societies established in Ireland and London for the encouragement of arts and manufactures could gather together a decent collection of the products of native looms, potteries, and foundries. To the Royal Dublin Society, established so far back as 1723, is indisputably due the honour of having first gathered together specimens worthily representing, under one roof, the excellences of Irish industry. Before the London Society of Arts could make a decent show from the vast hives of Lancashire, Cornwall, and Yorkshire, a collection of manufactures was brought together in Dublin of the most interesting and useful character. From that time up to the present, similar exhibitions have been held triennially, and always with increased success. In the face of those disastrous events which would have paralysed a less hopeful people, the Irish have steadily supported their triennial exhibitions. The vigour with which the Royal Dublin Society has pursued the enlightened object for which it was founded is unequalled, save by that of our London Society of Arts. These two societies have now, for more than a century, in conjunction with the Scotch Board of Trustees for the Encouragement of Manufactures, been actively engaged stimulating manufacturers to high achievements, and endeavouring to gather from abroad, for the benefit of the great native community, those results of experience which are accumulating for the future benefit of mankind in every country where industry is systematised. With their various successes the country is familiarly acquainted. The industrial exhibitions of Ireland, however, deserve particular attention at the present time, as they date further back than any held either in England or Scotland. Up to 1850, the contributors to the periodical exhibitions of the Royal Dublin Society were exclusively Irish; but in this year the authorities extended their plan, and called upon foreigners to compete with their countrymen. This exhibition was the finest and most promising of the series. The committee, or jury, refer in their report with particular satisfaction to the vast extent and splendour of this exhibition; and they claim for their society the distinction of having been the first to "open their honours and prizes for competition to the manufacturers of all countries, and to invite them to meet in honourable rivalry" within the walls of their institution.

The hopeful tone of this document suits well with the present aspect of commercial affairs. The committee tendered their acknowledgments to the English exhibitors of machinery, who, "regardless of cost and personal inconvenience, and undeterred by distance, succeeded in maintaining in action so many beautiful examples of manufacturing engines, by which the importance of the exhibition was so much enhanced." They also congratulated the committee of manufactures in having thus not only shown the great advantage of employing steam-power as the prime mover of such machinery, but in having demonstrated to the working-classes the importance of employing "this most important agent" as a substitute for other apparently more simple motive powers; and they trusted that the experiment made by the committee of impelling a number of different machines, through the medium of a shaft and pulleys, by one small steam-engine, might suggest to some spirited individuals the practical importance of having houses established in different parts of Dublin, in each room of which steam power of small amount might be hired to artisans requiring it, to enable them by its means to economise much time and labour.

The catalogue of this exhibition, a stout octavo, is a comprehensive list of Irish and English manufactures, numbering two thousand eight hundred and fifty distinct articles. The catalogue includes silks, damasks, muslins, linens, carpets, woollen drapery, hosiery, hats, leather, oil-cloth, cabinet-work, carving and turning, lamps, glass, porcelain and pottery, clock and watchwork, machinery, paper-hangings, and printing. The absence of the raw materials was the marked defect in the collection. Of the damasks we give a specimen, the Portland Vase Pattern. This was exhibited by Mr. Henning, of Waringstown, together with some fine specimens of printed cambrics for ladies' dresses, as a reward for which the society awarded a gold medal to the manufacturer. Irish poplins and Irish linens were remarkable both for workmanship and design. In short, the woven and textile fabrics exhibited were so generally good, that the jury found it a difficult matter to decide between competitors. Under the head of silks, tabinets, velvets, &c., some admirable specimens were exhibited by the principal firms of Dublin; and three gold medals were distributed among them. The manufacturers of Ulster exhibited damasks and cambrics which will enable them successfully to compete with the manufacturers of France, Germany, and the Netherlands, "even in the home markets of these latter."

The articles offered for competition were divided into four sections. The first comprehended all raw materials and produce. Under this head nothing beyond a few samples of prepared peat, peat charcoal, iodine, flax yarn, and leather was contributed: this department was, as has already been observed, the weakest of the exhibition.

The second section comprised manufactured articles. This section was undoubtedly the most important and interesting of the four; and the jury referred with pride to the number of articles of Irish production, excellent in design and manufacture, which it included. Under this section we find the names of many eminent English firms; among others, Messrs. Elkington and Mason, of Newhall-street, Birmingham, gained a gold medal, "for the design and execution of electro-plated articles;" while in the department of "porcelain, china, glass, delf, &c.," the winners of certificates were nearly without an exception Manchester and London firms. Furniture, matting, saddlery, perukes, combs, soaps, candles, ricks, blacking, umbrellas, lozenges, confectionery, and perfumery, were represented chiefly by Dublin firms, under the head "Miscellaneous."

Section 3 was devoted to "machinery, mechanical contrivances, and models." Department A of this section comprehended separate parts of machines. Although little was exhibited in this sub-section which could be strictly considered new, still it included several improvements in machinery which deserve notice. In the list of these improvements, a new railway friction buffer, invented by Mr. Wilfred Haughton, of the Dublin and Kingstown Railway, merited particular attention. This machine, according to the jury, is intended to be used at railway termini and sidings, as a safeguard in the event of a train being brought in at too high a velocity. It is simply a sledge, in the form of two inclined planes, resting upon the rails, and of the same gauge. These inclined planes, being united together by iron rods, form one machine, upon which the locomotive engine, in the event of the train overrunning its distance, will ascend, and the front wheel or other convenient part of the engine coming in contact with a stop placed at the end of the sledge, this latter is carried forward along with the engine, the whole weight of which is thus made effective in producing friction between the sledge and the rails, and so destroying the motion of the train. The chief advantage which the friction buffer possesses over the spring buffer in ordinary use is, that there is no danger of recoil, and that the cost is inconsiderable. The jury tested the efficacy of Mr. Haughton's invention, and were so satisfied with it, that they awarded him a gold medal, value £5.

A new furnace-bar was among the inventions noticed by the jury. This bar, contrived by Mr. Richard Robinson, of Belfast, applies the principle of the hot blast to ordinary furnaces; and the jury declared that its efficiency in promoting combustion was very remarkably shown at the exhibition. Owing to a deficiency of chimney draught, it was found impossible, during the first few days of the exhibition, to raise sufficient steam to drive the flax-dressing and other machinery in the temporary shed; but, after Mr. Robinson had substituted a set of his bars, this defect was altogether removed, and the supply of steam increased at a rate too rapid rather than too slow. From the lightness of the material used in these bars, it might be supposed they would be very speedily burnt out, but the constant current of the air through the bar prevents this result. This was clearly shown by observing the action of the fire on the bar when the damper was closed or open. In the former case, the whole bar became red-hot, but immediately on opening the damper, and thus permitting the passage of the current of air, the bar was observed immediately to cool down, and to continue cool.

In the second sub-section, that devoted to "machines for raising and moving bodies, steam-engines, carriages, ships, boats, &c.," Messrs. Grendon, of Drogheda (the first manufacturers who constructed locomotive engines in Ireland, for sale) exhibited a light passenger locomotive steam-engine. The cylinders of this engine had a diameter of nine inches, with a twelve-inch stroke, and the steam valves were wrought with the new patent variable expansive link motion. The diameter of the driving wheels was 4 feet; that of the trailing wheels, 2 feet 10 inches; and the engine was so constructed as to carry sufficient coke and water for a journey of twenty-five miles, at a speed of forty mile per hour. The advantages which it possessed over the engines in general use, as stated by the Messrs. Grendon, were, its not consuming more than one-third of the ordinary quantity of coke, and from its lightness causing much less injury to the permanent way. For this, and other specimens of machinery, the jury awarded to the firm a gold medal, value £5.

In the department of pleasure carriages there were many exhibitors, and especially builders of all kinds of improved jaunting-cars. Subsection 4 included "models and drawings, exhibiting the application of mechanical contrivances, &c." Amongst these were a model of a stationary engine, executed by Master Alfred Oldham, Rathgar, Dublin, aged fourteen; and a model of a patent brick and tilekiln, invented by Mr. John Ridgway, Staffordshire, and recommended as an admirable auxiliary to Irish drainage. From the list of philosophical instruments exhibited, the jury selected for notice a machine constructed by Mr. Thomas Grubb, for grinding and polishing speculums. "This machine was designed for the purpose of uniting in one the movements (or rather the resultants) as well of Lord Rosse's as of Mr. Grubb's machines, and also of a machine lately designed by Mr. Lassell, of Liverpool. On inspection, it appeared to unite the powers of all, combined with the advantages of simplicity and great compactness; the specimen machine exhibited, which measured about three feet each way, being adequate to grind and polish a speculum of two feet diameter. If it be desired to obtain the 'Rosselan' movement in this machine, it may be done by turning the endless screw, and the shaft moving the vibrating arm. The latter is analogous to Lord Rosse's 'first eccentric,' while the former produces both the slow revolution of the speculum and the effect of Lord Rosse's second eccentric; while the fourth movement required, viz. the slow revolving of the polisher, can, in the present machine, be readily governed (if found desirable) by giving a corresponding motion to the spindle of the vibrating arm. To obtain Mr. Lassell's movements (which are a series of cycles or epicycles concentric with the surface of the speculum), the vibrating arm is fixed at an eccentricity equal to the radius of the required circle of epicycloids, while the crank-pin of its revolving spindle is set to the radius of the epicycles themselves: this spindle and the speculum being thus kept simultaneously in motion, will produce the desired combination of movements. The peculiar advantages of this machine may be stated as follows:—First, in giving, with the simplicity of Lord Rosse's machine and greater simplicity than Lassell's, the movements of both; and not only this, but also the passing without loss of time from one method of working to another at pleasure. This is the more important, if, as we conceive, Lord Rosse's movements are best suited for grinding, and perhaps the early part of the polishing, while Mr. Lassell's appears good for the latter stages of polishing, particularly of mirrors of large *angular aperture*, and where the centre is removed, as in the Gregorian or Cassegrain mirrors. Second, by an evident combination of the several movements of which the machine is capable, those actions which produce the parabolic curve can be made to act continually in excess over *the same portion* of the circumference of the mirrors, from which there can be obtained at least an approximation to that peculiar elliptical figure which is still a desideratum for making a good front-view telescope."

It will be seen, from the variety of articles severally representing distinct departments of human industry, that the Dublin exhibition could fairly lay claim to the title of national. All the eminent manufacturers of the island figured in it, and not a few of those English firms whose fame is European were glad to place their products in juxtaposition with those of their Irish neighbours. The number of exhibitors who contributed to many successive exhibitions showed the most promising progress at each. On all hands, the management of these triennial bazaars received hearty co-operation from manufacturers; and the awards of the juries appear to have been treated with that respect which accompanies the honest fulfilment of judicial duties.

(To be continued.)

AGRICULTURAL IMPLEMENTS.—In our report of the agricultural implements at the Exhibition, in our Supplement of May 17, in speaking of an ingenicus machine for making hurdles, the name of the inventor was erroneously printed Barrett, instead of Burrell.

THE WRITER OF THE LETTERS OF JUNIUS was the secretary of the first Marquis of Lansdowne, better known as Lord Shelburne. From his Lordship he obtained all the political information necessary for his compositions. The late Marquis of Lansdowne possessed the copy bound in vellum (two volumes), with many notes on the margin in Lord Shelburne's handwriting; they were kept locked up in a beautiful ebony casket, bound and ornamented with brass. That casket has disappeared, at least so the writer has been told, and not many years ago inquiry was made for it by the present head of that house. Maclean was a dark, strong-featured man, who wore his hat slouched over his eyes, and generally a large cloak. He often corrected the slips or proofs of his letters at Cox's, a well-known printer near Lincoln's-inn, who deemed himself bound in honour never to divulge what he knew of that publication, and was agitated when once suddenly spoken to on the subject near the door of the small room in which the proofs were corrected, and with a high and honourable feeling requested never to be again spoken to on the subject. The late President of the Royal Academy, Benjamin West, knew Maclean; and his son, the late Raphael West, told the writer of these remarks, that when a young man he had seen him in the evening at his father's in Newman-street, and once heard him repeat a passage in one of the letters which was not then published. A more correct and veracious man than Mr. R. West could not be. Maclean stammered, and was consequently of no use to Lord Shelburne as a debater and supporter in Parliament. A place in the East Indies was obtained for him, and he sailed in the *Aurora* frigate for that dependency, and was lost in her at the same time with Falconer, the author of the poem entitled the "Shipwreck." The able tract published by Mr. Pickering, Piccadilly, would constitute a fair foundation on which to build the inquiry.—*From "Notes and Queries," No.* 80.

THE AGAPEMONE.—(Engraved in the ILLUSTRATED LONDON NEWS for March 29.)—According to the census return made by "Henry James Prince," as head of the family in the Abode of Love, 65 individuals were located there on the night of the 31st of last March. It appears, by the description of the persons in the census paper, that all, except Henry James Prince and Julia Prince, his wife, are enjoyers of this local board on very slight tenure indeed, as they are described, under the head of "relation to head of family," some as visitors and the others as servants. We give the following analysis of this pious sect:—5 clergymen without cure of souls; 1 civil engineer; 1 landed proprietor; 1 member of the Royal College of Surgeons, not practising; 2 annuitants; 1 solicitor and master extraordinary; 1 gentleman; 6 fundholders; 1 farmer of 509 acres, employing 30 labourers; 1 groom; 1 port-boy; 3 helpers in the stables; 1 shoemaker; 8 women house-servants; 2 dressmakers; 1 servant boy; 3 carpenters; 1 mason; 6 laundresses; 1 tailor; 9 wives of visitors; 7 unmarried female visitors; 1 unmarried male visitor, 16 years of age; 1 ditto, 7 years of age; 2 ditto, 3 years of age; and two female visitors, one of them 6 and the other 4 years old. Total of males, 30; total of females, 35. There are but 5 children of the respective ages of 7, 6, 4, 3, and 2 years.

GEORGE COPWAY.—A portrait of this North American Indian Chief, under the name of Kah-ge-ga-gah-bowh, by Mr. Samuel Howell, is now visible, at the artist's studio, in Newman-street. The Chieftain is painted in the act of speaking, as if addressing the Peace Congress in Germany, the audience at Drury-lane, or that in the Hall of Commerce, on the great object of his mission, the civilising and concentrating his own Ojibeway and other tribes of North America. The attitude is natural, and the colouring of the picture harmonious.

PRISONS OF GREAT BRITAIN.—The sixteenth report of the inspectors appointed to visit the different prisons of Great Britain, has just been presented to both Houses of Parliament, by command of her Majesty. The report refers to the northern and eastern district. Mr. F. Hill, the inspector, states that efforts had been made to introduce useful labour into the prisons, and enlarged provisions had been made for instruction in reading and writing at several prisons. If the principle of using each prison solely for the confinement of male or of female prisoners was adopted, he supposes that, with a slight modification of the law, upwards of fourteen prisons might be at once wholly given up. The difficulty of guarding against escapes of prisoners employed in agriculture is reported to have been greatly over-estimated. The number of prisoners in the district in 1850 was less by 235 than in 1849, but the number of prisoners in confinement at the end of 1850 was considerably greater than at the end of 1849.

IMMIGRATION TO THE UNITED STATES FOR THE MONTH OF APRIL.—(From the *New York Herald.*)—The following are the arrivals of passengers at this port from foreign ports during the month of April:—British ports, 22,924; French, 4083; Bremen, 2044; Chagres, 1049; Hamburgh, 515; Antwerp, 220; Amsterdam, 238; other ports, 132: total, 31,205. Total for April, 1850, was 15,757. It will be seen, therefore, that the increase in April of the same year is very great indeed, being about double.

Melbourne (Australia) journals have been received to the beginning of February, from which we learn that a colonist named Kentish had discovered a new motive power. The editor of the *Port Philip Gazette* writes that he has possessed himself of Mr. Kentish's plan, applicable to the propulsion of ships, &c., and expresses himself perfectly satisfied of its easy and economical application. He says, "It will very speedily supersede both steam and sails; indeed, so simple and so palpable is the principle on which it is based, that the wonder is how it could so long have been overlooked."

TOWN TALK AND TABLE TALK.

THE great experiment in Hyde Park is working out results, and exhibiting developments which were never dreamed of by the speculators, who, previous to the 1st of May, spoke or printed their vaticinations respecting the probable social fruits to be grown in the great conservatory by the Serpentine. As yet, there can be no doubt but that the classes who expected to be the greatest gainers by the Exhibition have been miserably disappointed. The managers of the London theatres, in particular, hailed the notion as certain to cram boxes, pit, and gallery every night. The crowds who would be attracted from the provinces, and from abroad, the general holiday-feeling which would be excited, the quantity of money which would be spent in London—all this, it was conjectured, would have the most beneficial effects upon places of amusement. The season was looked forward to as likely to prove an uninterrupted series of Boxing Days and Easter Mondays. There was to be a general social saturnalia. Everybody was to go to the Exhibition in the forenoon, and to the theatres, concerts, and so forth, at night. And the view seemed so natural, that it was never seriously disputed. The proprietors of rooms eligible for exhibitions asked unheard of sums for their property. The thousand and one caterers for metropolitan evening amusements set to work frantically to outbid each other for the possession of *loci in quo*, and any gentleman who aspired to amuse the public, from the biologist, with his *quasi*-scientific powers over the nerves, muscles, and brains of his patients, to the more unpretending juggler, who openly avows that his magic is prompted by no other spells than ingenious apparatus and sleight of hand; every candidate, in fact, for stray patronage and stray shillings, believed that all through the summer he would only have to open his doors, and the gentle public would rush pell-mell in—that he would only have to unbutton his pockets, and the shillings and half-crowns would pour into them as through a spout. Great has been the difference—great the disappointment. The Exhibition is found to absorb all appetite for general sight-seeing, and probably all the money generally laid out for sight-seeing. How many a season ticket has been purchased with guineas which would, were Hyde-Park in its normal condition, have gone in comfortable stalls and snugly-curtained private boxes! How many a five shillings has been unhesitatingly handed over to the functionaries presiding at the scores of turnstiles, which in other circumstances would have rattled in the money-boxes of the theatres! And not only does the Exhibition absorb the money, but it absorbs the energy, the desire, the very faculty of sight-seeing. There are few harder days' works than a conscientious four or six hours passed in the Crystal Palace. The vast panorama of novelties—the ceaseless whirl of new and still newer objects of attraction—first bewilders, and then fatigues. The stoutest and the hardiest man in London, who has spent a forenoon and afternoon in wandering over the industrial world, racking his generalising powers all the while, constantly seeking to classify and arrange, in order that he may understand; the man with even the greatest degree of mental and bodily powers, after such a day's employment, will leave Hyde Park jaded, spent, and utterly unfit for further exertion. Thus, then, it happens, that the Exhibition is rising upon the temporary ruin of all other places of amusement. Everybody goes to it, and nobody goes anywhere else. Its attractions swallow up all rivalry. People hardly speak or think of anything else; and so the regular theatres are left with hardly sufficient nightly receipts to pay for the gas, while many of the minor exhibitions have shut up altogether. I hear, from good authority, indeed, that the present depression in theatrical matters is something perfectly unprecedented; and if it should be determined to keep the Building open until eight o'clock, I understand that it is likely that several of the principal houses will at once close their doors. In the matter of lodgings an equal disappointment has been experienced. Probably, when the shilling season has finally set in, and the cheap trips have actually commenced—the speculators in furnished apartments will be at least partially recompensed; but it is a fact, that, never since London was London, was there a greater number of lodgings to let than at the present moment. Prices have of course fallen in a corresponding degree, and many a drawingroom floor is to be had for as many half-crowns per week as before the 1st of May the expectant landlady would have demanded half-sovereigns.

Captain Somerset's late sojourn in the House of Correction has formed a common topic of conversation, and on the whole Mr. Hardwick's decision seems approved of. At the same time, there is a cant about equal justice which people often fall into with the very best intentions. Thus, if a fine falls unequally on a rich man and a poor, imprisonment may also fall unequally on two individuals moving in different spheres. Take a costermonger, or a cabman, or an Irish labourer. Ten days' imprisonment to the majority of such persons is merely ten days' loss of work—ten days' privation of liberty; no moral effect lasting for years, perhaps for life, pursues them. Society does not look cold upon them after their release. They lose no more social position than they would had they been ten days in the hospital, or ten days confined by illness in their own beds. In cases from other classes of society, the result is very different. There, the mere nominal and legal penalty is only the nucleus of the real punishment. It is not the imprisonment and the coarse fare, nor even the hard labour, if such be imposed, which constitute the penalty; that is to be found in the tone and feeling of society—looking in a greater or less degree askance upon the man who has worn a prison coat and been locked up by turnkeys. In this respect, no doubt, society may be often harsh, if not unjust; it may judge with little proper discrimination and with little philosophy; but a sentence pronounced by it is always a sentence; and a hundred thousand myrmidons, by a hundred thousand looks and words and actions, carry the penalty relentlessly out.

A great social war seems on the point of breaking out between the public and the cab-drivers. The fares have turned round upon the Jehus, and we shall shortly see who is stronger. The plain truth seems to be, that, for the last ten years or so, our friends of the cab-stands have been regularly pocketing at least twice as much as they were entitled to. I am tolerably often in cabs myself, and I know a good many people who are still more liberal patrons of the patent safetys; but I never yet knew eightpence given as a fare, still less the half-miles over and above the first mile computed as fourpence each. Fares invariably go, not by eightpences and fourpences, but by shillings and sixpences, while distances, at the very least, swell out into similar proportions. The authorities now, however, seem to have taken up the matter in earnest, and some degree of reform may be reasonably counted upon; some degree only, however; for so long as cabmen continue to be, as in the course of things they always will, coarsely-mannered men, unscrupulous in language, and fierce in dispute, so long will the better class of persons—often ladies—whom they carry, rather submit to a degree of extortion than enter the controversial lists with so Billingsgatish an opponent. In the meantime, however, the omnibus and cab interest have found out that horses' food and fodder is twenty-five per cent. dearer than last year. What say the Protectionists to the fact? I suppose, that, in these days of railroads, if oats and hay be dearer in Middlesex, they will be dearer in Lincoln and in Somerset; and that if an omnibus man disburses £125 where he used to disburse £100, the inference is, that the distressed agriculturist, who was not so distressed last season, has pocketed the difference. But who is to hold the balance even between the persecuted farmers and the persecuted cabmen, neither of whom are to be allowed to charge the public for their respective wares a "remunerative" price—in other words, just as much as they please?

The number of learned policemen who have sprung up under late regulations, and who swarm within and without the Exhibition, is incredible. Addison was not more surprised at hearing the French children speak French than the generality of people are, when they witness a mere ordinary-looking "peeler," one of the tribe whom we have so long joked about, and who have formed so standard a body of imputed lovers to the cooks and housemaids of the metropolis, coming suddenly out in the full blaze of polyglot distinction, and addressing a bewildered Frenchman or a bemused German in the vernaculars of the Rhine or the Seine. There is an odd incongruity between the coarse familiar garb and the accomplishments of the wearer. "Now then, move on, will yer," was all that was generally heard of a policeman's lingual powers. He was too grand to chatter, and he only opened his mouth to command. With the polyglot force, however, the case is different. The French and German speaking policemen are evidently not disposed to hide their lights under bushels. They take foreigners under the most benign and conversational protection, discourse affably of the Exhibition and of things in general, all of which now-a-days, by the way, are included in the Exhibition, and pounce suddenly—and herein lies one of their best features—upon the rascally cabman, who is vehemently engaged in fleecing a helpless gentleman with wide trousers and a beard, to the utter overthrow and bewilderment of cabby, who, confident in the inability of his fare to plead his own cause, has his heels suddenly and most unexpectedly tripped up by an unlooked for "Dites, donc, monsieur, qu'y a-t-il à present?" from a blue-coated functionary, whom nobody ever dreamed of supposing gifted with any other tongue than the familiar accents spoken within earshot of the bells of Bow.

Meantime Parliament shares in the general depression and neglect experienced by all the other ordinary places of amusement. Never have we had more languid and less read debates. Never had we a more quick succession of "no Houses" and "counts out." Mr. Hume, the other day, after his discomfiture in bringing forward his annual Reform motion, was seen, within half-an-hour after the failure to make a House, sauntering in the nave of the Crystal Palace, receiving with a sort of puzzled good humour the half condolences half congratulations of his acquaintances; while the hon. member made only a very feeble and skin-deep resistance to the preposition for a holiday for the Derby. The fact is, that people are gradually making up their minds to wait for real business until next year. We are then, at all events, to know by whom the country is to be governed. The final, and, perhaps, fiercest, struggle between Protection and Free Trade is to be then fought. The Whigs are to inscribe a new Reform Bill, of greater or less, most probably of less, dimensions, on their banners. The Stanleyites are to make the onset to the cry of "Protection, and no Income-tax!" The battle is for to-morrow, but there is rest or preparation in either camp to-night.

A. B. R.

MEETINGS OF PUBLIC SOCIETIES,

IN THE WEEK ENDING MAY 24.

BRITISH ANTI-SLAVERY SOCIETY.—On Monday evening a *soirée* was held, at the Freemasons' Tavern, Great Queen-street, by the friends and supporters of the society. A large number of ladies and gentlemen attended, amongst whom were several natives of Africa. Mr. E. W. Alexander presided on the occasion, and after the entertainment had ceased, addressed a few words upon the subject of the objects of the society, and its past success. The Rev. J. Howard Hinton, Mr. Joseph Sturge, and the Rev. A. H. Garnett, U.S., having offered some remarks upon the iniquity of slavery and the traffic in human flesh, Mr. Peto, M.P., said that he had received an invitation to attend this meeting, and that he could not refrain from taking advantage of it to express his sympathy with the objects of the society. There were, in his opinion, three ways by which they could aid, if not effect, the total liberation of their African brethren. The first was, in the present year, when so many slaveholders from the United States were in England, to receive into fellowship with a hearty goodwill those of their black brethren who were in England, but steadily and firmly refuse to receive into fellowship such American visitors as were slaveholders, and who carried on a traffic in their fellow-creatures. He could not look upon such a proposition as narrow-minded or sectarian, but as a natural expression of the Christian doctrines. The second way by which they could promote the abolition of slavery was by throwing open the pulpits of this country to students who were men of colour, and by receiving them freely and familiarly at their tables. The third way which he had to propose was to agitate the question to the very utmost, when there were so many Americans in this country. No means should be neglected, and he sincerely prayed that their efforts might be successful. The Rev. Alexander Crummel, United States, of African descent, but now an Episcopal clergyman in New York; Mr. Horace Greeley, editor of the *New York Tribune*, and other gentlemen, addressed the meeting, all of whom advocated the necessity for exertion in the cause of the African. A vote of thanks to the chairman concluded the proceedings.

BRITISH BENEFICENT INSTITUTION.—The anniversary festival of this institution was held on Saturday, at the Freemasons' Tavern, Lord De Mauley presiding. The chairman, in proposing the toast of the evening, "Success to the British Beneficent Institution," observed that the class of persons relieved by this institution were, from their former habit of life (those who had moved in respectable society), peculiarly exposed to suffering, and it was impossible for them to provide for themselves by their own efforts, as they would have been enabled to have done had they not been fostered in fortune's lap. Since the foundation of the institution in 1850, nine ladies had been placed on the funds, and were receiving annually the sum of £30. Thirty-two ladies, whose cases were admitted as eligible, were still remaining on the list of candidates, many of whom had held high and honourable positions, and had been reduced, by sudden bereavement, to the depths of poverty. In the course of the evening the secretary read a list of subscriptions, which, when added to the annual subscriptions, made a total amount of £1050.

BRITISH LADIES' FEMALE EMIGRANT SOCIETY.—The annual meeting of this society was held at the Hanover-square Rooms on Wednesday, the Right Hon. the Earl of Harrowby presiding. The report stated that the society was formed to carry out four objects—1. To establish homes for the reception of the female emigrants, where they may be instructed and prepared prior to their leaving their native country. 2. To provide visitation at the ports, where the emigrants are formed into industrial classes, and supplied with means for their instruction and employment during the voyage, through the agency of the visiting committees. 3. To secure the appointment of judicious and efficient matrons for the superintendence of the young women on the voyage, through the agency of the matrons' committee. 4. To form corresponding societies in the colonies, for the protection and assistance of the female immigrants on their arrival. With regard to the first, nothing as yet had been attempted. The benefits of such a home would be very important; but, even on a small scale, would cause an expenditure of £300 or £400, which the committee had not yet at their disposal. With regard to the second object, during the past year 1649 single female emigrants had been visited and instructed through the agency of the society. 70 ships had been visited by the Rev. Mr. Holderness and assistants; farewell services held on board, and the books and materials for employment gratefully received. The society have, during the year, distributed 1550 volumes of books, in addition to a large supply received as grants from societies, and contributions from private individuals. In order to keep the emigrants employed, the society have exerted themselves in preparing matrons for their duties, and have obtained many of them passages out in the different emigration vessels; but they think the duties would be better performed if they could organise a body of professional matrons—which they believe would not be at all difficult—who would perform voyages out without intending to stay in the colonies as emigrants. The total income for the year has been £1137 0s., and the expenditure £811 12s. The report was adopted, resolutions in support of the charity passed, and a collection entered into in aid of its funds.

RAGGED SCHOOL UNION.—The annual meeting of this society was held on Tuesday at Exeter Hall; Lord R. Grosvenor in the chair. The report stated that the increase during the year had been in the number of schools, 7; Sunday scholars, 422; week-day scholars, 463; and evening scholars, 220; in the industrial school, 286. The total number of schools at the present time amounted to 102; of Sunday scholars, 10,861; week-day scholars, 6021; evening scholars, 5572; industrial, 2062; paid teachers, 180. During the year 3 girls and 81 boys had been enabled to emigrate by the united efforts of the union and local schools, which made the total number sent out to the colonies 207. The committee had expended £600 for this purpose alone during the year. The industrial classes continued to increase in numbers and efficiency. A grant of bibles had been given them from the Bible Society, and £13 from the emigration fund. The receipts for the year amounted to £3387 11s. 11d., and the expenses to £3076 16s. 5d., leaving a balance of £210 15s. 6d., and for the emigration fund the receipts had been £951 14s., and expenses £637 10s., leaving a balance of £314 4s. The report was unanimously adopted, and the meeting separated. The evening meeting of the same society was held at Exeter Hall. Lord Ashley, M.P., presided; and observed that the Ragged School Union had now placed its anniversay amongst the anniversaries of the other great religious societies of this kingdam, and he considered very justly so—(Hear, hear)—and from its principles and its fruits, it claimed the sympathy and support of the Christian public. In 1845, when its operations first began to be systematised and promoted with real energy, they had seven schools, with 717 scholars. The example had been In 1851, they had 102 schools, and 10,861 scholars. followed, and he was happy to say that many schools had been established, which were not in union with that society. The report was then read, an abstract of which is given above, and several gentlemen having addressed the meeting, the meeting separated.

LONDON SOCIETY FOR TEACHING THE BLIND TO READ, REGENT'S-PARK.—A meeting of the friends and supporters of this interesting charity was held on Wednesday. From the report read it appears that the blind are taught in this institution by means of embossed short-hand characters, the mastery of which is obtained in a time seldom exceeding three months. The Scriptures are the first books placed in the hands of the pupils; and since the institution was founded, in 1838, more than 500 persons, many of them before that time wholly uninstructed, have been enabled to study for themselves the inestimable lessons of the Gospel. Additional instructions in every branch of useful education have also been afforded—in the elementary rules of arithmetic, writing, and geography; while at the same time a special regard has been paid to the general development of the mental faculties, so as to enable the pupils in their several degrees to assist themselves through life by their own personal exertions. The building recently executed can be enlarged when the funds will permit; at present it is capable of accommodating 80 recipients, with suitable grounds for exercising, and every provision for the health and comforts of the pupils. There still, however, remains a debt of £1500, the interest of which operates as a heavy incumbrance upon the society's income. The number at present in the school is 64, male and female.

NORTH LONDON SCHOOL OF DRAWING AND MODELLING.—The first annual distribution of prizes to the pupils of this school, established for the instruction of workmen employed in casting and chasing of metals, masonry, carving, plastering, cabinet-making, house painting and decorating, &c., in a true knowledge of form, as applicable to the execution of designs in which natural objects are introduced, took place at the School-house, Mary's-terrace, High-street, Camden-town, on Wednesday evening. The Rev. D. Laing, M.A., F.R.S., presided, and congratulated the pupils on the great progress made by the school since its establishment. His Royal Highness Prince Albert, having specially sent a gentleman to inspect their school, had been pleased to become its patron, and had presented it with a handsome donation. The committee, in order to avoid the appearance of any partiality in the distribution of the prizes, had applied to the President of the Royal Academy, Sir Charles Eastlake, to decide upon the respective merits of the drawings. This Sir Charles had kindly consented to do, and had decided to what drawings the prizes should be awarded without knowing even the names of the parties producing them. The rev. gentleman then proceeded to distribute the prizes, consisting of a number of elegantly bound volumes, to the young girls and youths to whom they had been awarded, the former showing by far the greater talent as artists.

CHURCH-BUILDING SOCIETY.—The thirty-third annual meeting of the Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels, took place on Wednesday, at the offices, 79, Pall-Mall. The Archbishop of Canterbury presided, and was supported by the Bishop of London, the Bishop of Oxford, the Bishop of St. Asaph, the Bishop of Bangor, the Bishop of Lichfield, the Bishop of Ripon, the Right Hon. Earl Howe, Lord Bayning, Sir R. H. Inglis, Bart., Sir T. Phillips, the Rev. S. Lowe, &c. The report stated, that the society had during the past year given aid to the enlargement of 63 existing churches, in which 10,000 additional sittings had been obtained, the whole of which were free for the use of the poor; and, in addition, 167 hitherto appropriated. The number of churches and chapels proposed to be built this year, by aid from the society, is 42; that reported last year being 39. The places aided by the society during the year were 18 in number, with a population of 77,491 souls; and containing only one small church, accommodating 175 persons. When the new churches are completed, they will accommodate 95,180 persons, out of a population of 481,818 souls, or less than one-fifth; and 73,840 of the seats will be free for the use of the poor. 12 churches have been rebuilt, and 63 restored. The whole number of places assisted was 117; the sum granted, £15,266 for repairing churches. In the manufacturing and mining districts, the society paid grants to 107 places, amounting to £14,940; completed 34 new churches, rebuilt 16, and enlarged 57; securing 30,827 new seats, of which 27,792 are free to the poor. Resolutions in support of the object of the society were agreed to.

TRINITARIAN BIBLE SOCIETY.—The twentieth anniversary of this society was held, on Wednesday, in the Lower Room, Exeter Hall; Admiral Vernon Harcourt in the chair. The proceedings were (as usual) opened with prayer. The report, which was read by Mr. Johnson, the secretary, stated that the society has been instrumental, since its commencement, in circulating 329,404 Bibles, and portions of the same, in almost every quarter of the globe. During the past year the issues have been:—In the English language—Bibles, 8600; Testaments, 5093; portions, 50. In Hebrew, 1; in the Portuguese, Spanish, and Italian languages, 276; in German, 1; in the Irish language, 27,100 portions. The receipts during the year (including a small balance from the last) amounted to £1966 11s. 5d., and the expenses to £1958 6s. 9d., leaving a balance of £8 4s. 8d. The committee also acknowledge a legacy of £2000 left by the late Miss Cooke, of Cheltenham.

PREVENTION OF CRUELTY TO ANIMALS.—The 25th annual general meeting of the Society for the Prevention of Cruelty to Animals was held, on Tuesday, at the Hanover-square Rooms; the Marquis of Westminster in the chair. The report stated that the committee had much pleasure in announcing that in August last an act similar, though not quite so comprehensive, was passed, extending their labours to Scotland. They stated, that, being impressed with the cruel and dangerous consequences of a live cattle market in the metropolis, they resolved to assist the exertions being made to procure the removal of Smithfield Market, and they contributed the sum of £100 to the funds of the association having that object in view. The balance-sheet was then read, from which it appeared that the total receipts, together with the balance carried forward from last year of £563 8s., amounted to £2290 13s. 6d.; and after all the necessary expenses had been defrayed, there was left a balance in the hands of the bankers of £491 14s 10d.

ROYAL NAVAL FEMALE SCHOOL.—The eleventh annual general meeting of the friends and subscribers to this useful charity—which was founded in the year 1840 by the late Admiral Sir Thomas Williams, C.B., for the purpose of bestowing upon the daughters of necessitous naval and marine officers, of and above ward-room rank, at the lowest reduction of cost practicable, a good and religious education in conformity with the doctrines of the Church of England, was held on Saturday last at Willis's Rooms, King-street, St. James's; Earl Manvers in the chair. The hon. secretary read the report, which was highly satisfactory. The number of pupils belonging to the school was 84, of whom 9 had lost both parents, and 29 had lost their fathers. At the usual half-yearly examinations at Midsummer and Christmas the pupils had shown great ability and industry. The apprehensions felt on the formation of the Queen Adelaide Fund were now abated, and the committee expressed their conviction that they were both calculated to confer great benefits on the families of naval and marine officers. The total receipts during the past year had been £4319 9s. 7d., and, after defraying all the necessary expenses, there was left a balance of £699 16s. 1d.

LONDON ANTIQUITIES.—At the last meeting of the British Archæological Association, held at their rooms, in Sackville-street, a vast quantity of antiquities, recently discovered in the City, in the line of alterations in Eastcheap, were exhibited by Mr. Lott, Mr. Davis, and others. Mr. Burkitt presented copies of two very curious sepulchral slabs, found in the foundation of a house in Newgate-street, on the spot where formerly stood the gateway of the old Grey Friars' Monastery. They are about six feet in length each, having an inscription in Norman French. One of them is of an oolite stone, and somewhat defaced, from exposure to the weather since its discovery. The writing, however, is still intelligible, and reads, "Ici gist Daunz Philip de Serpham coyne. de. Ely. a. vy. Deu. pace. ueral. merci." The other is of black Purbeck marble, with the following inscription:—"Bernart. de. Jambe. gist. ici. Deu. de. sa. alme. eit. merci, amen." The exhibitor of the drawings of these interesting memorials said that he believed these were the only existing relics of the once famous monastery of the Grey Friars, in the chapel of which, according to Weever, were buried four queens, four duchesses, one duke, two earls, eight barons, and 35 knights, and in all 663 persons of quality. In the choir were nine tombs of alabaster and marble, all of which, with 140 marble grave-stones, were sold by Sir Martin Bowes, the Lord Mayor in 1545, for £50. The introduction of these subjects called forth a discussion on the state of City antiquities. Mr. Lott laid claim to being the founder of the museum now in Guildhall, and hoped the increasing taste for these subjects would soon make it worthy of the great City; and he took this favourable opportunity of stating that he should feel great pleasure in forwarding the objects of the association by devoting a day at any time the council should fix to make a party, including the many country and foreign members now in London, and to accompany them to the crypts and other objects of interest not usually shown to strangers.

THE NEW LAW FOR THE PROTECTION OF APPRENTICES AND SERVANTS.—The important act of Parliament, which received the Royal assent last week for the better protection of persons under the care and control of others as apprentices or servants, and to enable the guardians and overseers of the poor to institute and conduct prosecutions in certain cases, is now in force. The act resulted from a late painful case: it contains nine clauses. It is provided that persons—masters or mistresses—refusing or neglecting to supply necessary food to apprentices or servants, or unlawfully assaulting them, are guilty of a misdemeanour, and liable to three years' imprisonment with or without hard labour. The costs of such prosecutions are to be allowed. A register is to be kept of young persons under sixteen years hired or taken as servants from any workhouse, with particulars as prescribed in a schedule annexed to the act. Young persons who are hired from workhouses, or bound out as pauper apprentices, are to be visited twice at least in every year, and the officer is to report to the guardians "in writing whether he has found reason to believe that such young person is not supplied with necessary food, or is subjected to cruel or illegal treatment in any respect." Where the residence is more than five miles, the parties are to be visited by the officer of the union or parish in which they reside. The act authorises and requires parish officers to prosecute in certain cases were injury has been inflicted on a poor person under sixteen years of age. Justices are to bind over parish officers to prosecute, and the costs of such prosecutions are to be allowed. The act extends to England and Wales.

GREAT METROPOLIS WATER BILL.—This bill proposes to provide a better supply of water to the metropolis, and for that purpose to unite into one body corporate and politic the New River Company, the East London Waterworks Company, the Lambeth Waterworks Company, the Chelsea Waterworks, the Grand Junction Waterworks, the Kent Waterworks, and the Hampstead Waterworks, under the title of the "Metropolis Water Company," the capital to consist of one consolidated stock, the old companies to be dissolved, with powers for the Treasury to purchase all the property, works, and rights.

MANAGEMENT OF THE ROYAL WOODS AND FORESTS.—The Government bill to make better provision for the management of the woods, forests, and land revenues of the Crown, and for the direction of public works and buildings, has been printed. It contains 36 clauses. The object of the bill is to separate the duties of the Commissioners of Public Works and Commissioners of Woods and Forests. The First Commissioner of Woods, on the passing of the act, is to be the First Commissioner of Works and Buildings. Alterations are to be made in the two departments. The Royal woods and forests are to be placed under the management of a surveyor-general. The Commissioners of Woods and Forests are not to sit in the House of Commons. The First Commissioner of Works may sit in the House of Commons, whose salary is not to exceed £2000 a-year. The Commissioners of Works and Buildings are to manage the Royal parks.

DISCOVERY OF AN ANCIENT SCLAVONIAN IDOL.—The German papers state that about three weeks ago, as some boatmen were dredging in the river Zbrucz, which separates Gallician from Russian Podolia, they came on a colossal statue in stone, which they succeeded in bringing safe to land. The height is about 18 feet, and the figure has four heads covered with curly hair, and without beard. It was recognised immediately to be the representation of Svantovit, one of the principal gods of the old Sclavonian race. It is supposed to have lain in the water for at least ten centuries, and is in excellent preservation, nothing being wanting except the bow and horn, the former from the right hand, and the second from the left. This divinity had a celebrated temple at Arkona, in the isle of Rugen, where human victims were sometimes offered up. This temple, remarkable for the wealth which it contained, was destroyed in 1168 by Waldemar I., King of Denmark. This statue, which is the only one extant of the divinity, has been presented by Count Potocki, on whose ground it was found, to the University of Cracow.

The New Zealand *Southern Cross*, of Dec. 31 last, speaking of the Panama route, says: "On Saturday last our citizens were startled with an extraordinary "novelty," the barque of that name having arrived in port from San Francisco in the short pace of twenty-nine days, bringing London news to the 2d October. Here is another and remarkable testimony to the change in our geographical position, which the Panama route is certain to effect."

Duties were paid in the Clyde ports, between the 9th and 15th inst., both inclusive, on the following articles:—Sugar, 15,663 cwt.; molasses, 18,493 cwt.; coffee, 18,434 lb.; tea, 49,105 lb.; tobacco, 28,189 lb.; pepper, 1872 lb.; wines, 3308 gallons; spirits, 2338 gallons; foreign flour, 6194 cwt.; foreign wheat, 2402 qrs.; foreign barley, 1024 qrs.; foreign beans, 43 qrs.; Indian corn, 642 qrs.

APPLEGATH'S VERTICAL PRINTING MACHINE,

EXHIBITED BY THE PROPIETORS OF THE "ILLUSTRATED LONDON NEWS."

It seems necessary, before describing the beautiful machinery of Mr. Applegath, erected at a great cost, for printing the ILLUSTRATED LONDON NEWS within the walls of the Crystal Palace, to say a few words as to the rapid progress which has been made of late years in the multiplying power of this important class of machinery. Before the introduction of steam, and even for many years after, the largest number of newspaper sheets which could be printed off in one hour amounted to only one-fourth of the number which were thrown off on the first introduction of "self-acting and steam-impelled machinery" by the spirited proprietors of the *Times*. This wonderful and important change took place in November, 1814; since which time the whole appearance, even of the most improved printing-offices, has been entirely changed. As the power of production in the case of newspapers, as in that of manufactures, has been increased from year to year, in a great measure owing to that wonderful agent steam, so has the demand gone on increasing in a ratio truly astonishing. This demand required on the part of newspaper proprietors generally, and especially of those of the *Times*, compelled them to call in the aid of men well skilled in mechanical arrangements to design a machine capable of throwing off 4000 printed sheets per hour, instead of 1000. This problem was accomplished by Messrs. Cowper and Applegath, who had already effected many improvements in the printing press. The solution of this problem was effected by the introduction of four *paper* cylinders, and four sets of inking-rollers, instead of one of each such cylinders, as formerly; while one form, as before, containing the type, was made to pass over the various rollers, first in one direction and then in the other.

Within a few years, the circulation of the *Times* has increased to so great an extent that the ordinary reciprocating machines were found to be unavailing in supplying the enormously increased demand; and, instead of four thousand copies in an hour, Mr. Applegath was requested to tax his ingenuity in order to produce a machine capable of printing 10,000 sheets within the same time. It would be interesting to know the numerous difficulties which, in all probability, presented themselves, in practically solving this extraordinary problem, suffice it to say that such a machine was produced, and has now been successfully worked for a considerable period. Those of our readers who have had the good fortune to see Mr. Applegath's vertical printing machine at work in Printing-house-square, will not be taken by surprise by that which forms so interesting an object on the north side of that department of the Exhibition appropriated to "machines in motion," as it is in principle precisely the same, but of less power.

The greatly-increasing demand for the ILLUSTRATED LONDON NEWS has induced the proprietors, in order to insure an early weekly delivery to their customers, to apply to Mr. Applegath to put up one of his vertical printing-machines in the Crystal Palace, which, while it will enable the proprietors to facilitate the Saturday morning early delivery, will also gratify the millions of enquiring visitors to the Great Exhibition. It must be convincing to our readers that the task we have weekly to perform—of conveying the *most recent intelligence* by a *real representation*, is far more difficult than merely setting up in type a few sentences, which may be effected in a very short time, and issued from the press almost immediately afterwards. Very different is our task. The object to be artistically represented, at whatever distance from the printing-office, *must* be seen by the artist, and *must* then be rapidly, as well as faithfully, transferred to the wooden block to be engraved, and which, by an ingenious division of labour, is accomplished in an inconceivably short space of time. It must be remembered, that, the woodcuts, once engraved, can neither be increased nor decreased in size, nor can any material alteration be made therein.

When the wood-cuts and type are got into the requisite dimensions, the pages are fixed in the iron frames, or *chases*, and are transferred to the printing machine, for the purpose, in the first instance, of undergoing a very important and delicate operation called "overlaying," by which the pressure is diminished in the lighter parts of the engravings and increased in the dark shadows, without attention to which the artistic effects would be entirely lost. This overlaying is sometimes a very tedious and difficult process. While all those preliminaries are in progress, the hour of "going to press" is rapidly advancing; and although more time might often be very profitably employed in giving the best possible effects to the cuts, so as to gratify not only the public, but the artist himself, yet in order to throw off the requisite number of copies within a limited period, all other considerations must be set aside. Thus, between the desire of delineating the most recent objects of public interest, and that of producing them in large quantities, and at the same time in the most artistic style, a kind of antagonism has existed, which has only been neutralized by the most intense exertions on the part of all concerned; and we now venture to hope that the difficulties we have had to contend with will entirely be done away with, as the improved machinery, by its increased power of production, will render such impediments less likely to occur.

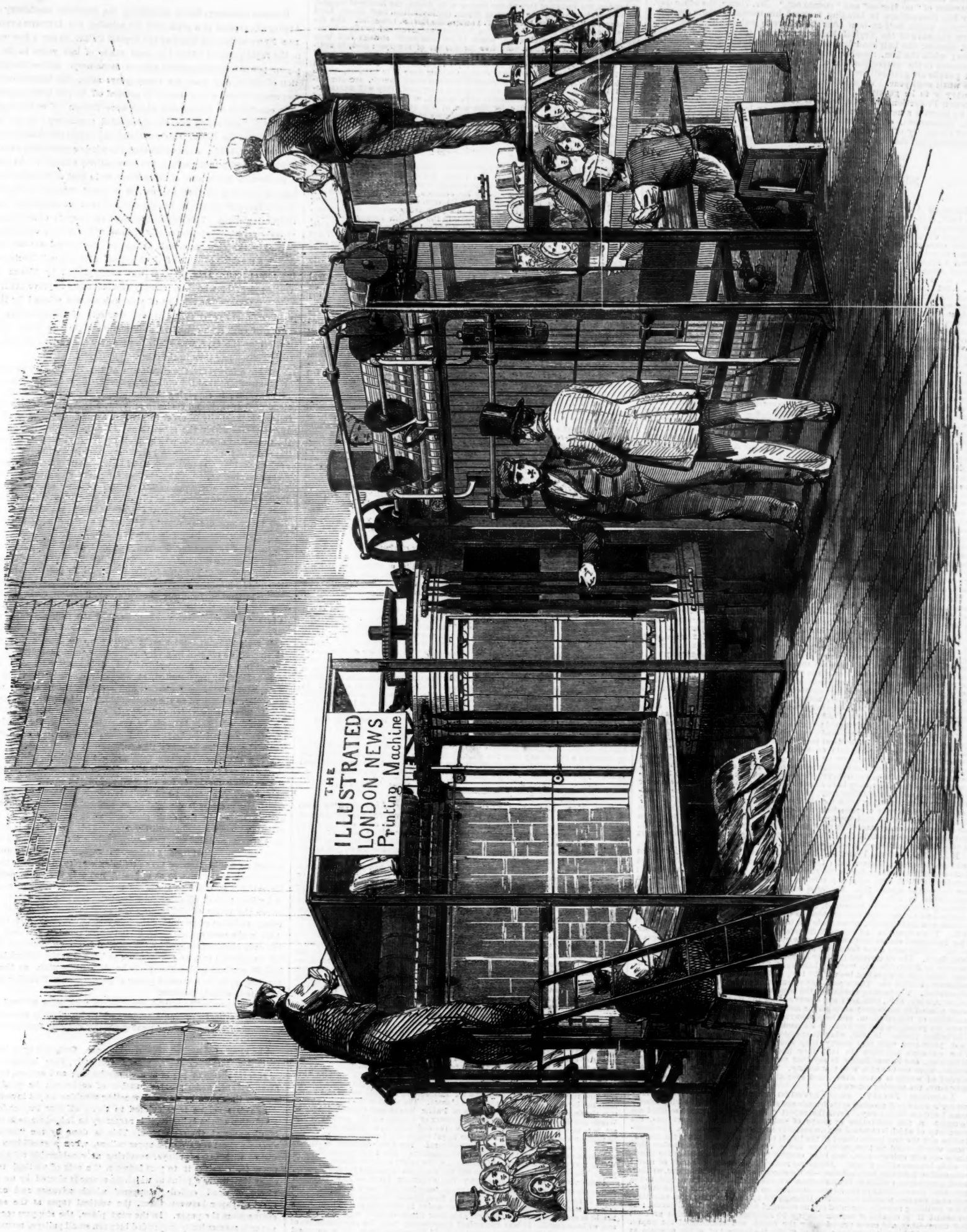
We now proceed to furnish our readers with some account of the Applegath Vertical Printing Machine, which has already attracted crowds of visitors from some of the more generally enticing sections of the Great Exhibition.

The chief novelties of this machine are, first, the type being placed around a large cylinder, placed vertically, thus leaving impressions on several sheets of paper at each revolution; and second, that, by such arrangement, a far greater number of copies can be produced within a given time than by any reciprocating machine as yet invented.

As this machine is calculated to throw off four impressions for each revolution of the cylinder, it is necessary to introduce as many sheets of blank paper at the same time. This is done by the "layer on," who draws a sheet towards the upper rollers, when a small iron spindle furnished with brass pulleys, revolving at considerable velocity, descends upon it, causing it to pass between the sets of vertical tapes, which carry it down to a point at which its course is altered by narrow upright pieces of wood, called "stoppers," which advance and compress the sheet of paper between them, the vertical tapes at the same time receding from the paper. In the next place, the stoppers recede, and the paper is momentarily suspended between small pulleys, mounted on delicate springs, called "finger rollers. The sheet is now impelled towards the impressing cylinder by means of vertical rollers in rapid motion on either side of the sheet, which is secured by the ordinary marginal tapes, and, passing round the impressing cylinder, receives an impression from the type fixed in the great vertical cylinder. The sheet, thus printed, passes towards the "taking-off" table, being supported in its progress by the upper pair of tapes, which are stopped at the proper time, leaving the sheet suspended between small spring pulleys above it, until the "taker-off" removes it to the table.

The type cylinder, which is really the great feature of the invention, consists of three strong circular rings of cast iron, securely keyed to an upright spindle. The segmental chases, which contain the type and wood-cuts, are attached to the circular rings by screws.

During the revolution of the type cylinder, it comes in contact with four printing cylinders, each of which is exactly one-fourth of its diame-



THE "ILLUSTRATED LONDON NEWS" (APPLEGATH'S) PRINTING MACHINE.

PATENT VERTICAL PRINTING MACHINE, IN THE GREAT EXHIBITION.—CLASS C, No. 122.

ter. The printing cylinders work into the type cylinder by means toothed wheels placed beneath them.

The surface of the impressing cylinders is made partly of fine woo llen cloth, and partly of paper, or from card board, reduced in those pa rt requiring the overlaying, by cutting or scraping, according to the t hick ness required. The ink is carefully spread over a circular invert opposite to the type, and connected to the vertical spindle of the type cylinder by hinged arms resting on an upright bar, which is terminated by a pulley. This pulley acts upon a circular undulating railway fixed below the type cylinder, and from which the distributing surface receives a slight up-and-down motion as it revolves. The distributing surface is fed with ink by means of vibratory rollers, which continue in action between it and the upright ink boxes placed under the copper reservoirs.

The contact of the inking-rollers with the type is regulated by long coiled springs connected with the bearings, so that they merely touch the surface of the letters, which is one of the great advantages of the vertical portion of the machine. To show the advantage of this arrangement, it is only necessary to mention, that in the case of the *Times* machine, 40,000 impressions have been taken without any difference being discovered between the first and the last. Another advantage of the vertical machine is, that the dust or small particles adhering to the per are shaken from it when suddenly stopped, and fall to the floor, in stead of being deposited upon the form or distributing table, as in the case of horizontal machines.

Mr. Applegath is still occupied in making further improvements in this valuable invention, with a view to render it suitable for the printing business generally.

London: Printed and published at the Office, 198, Strand, in the Parish of St. Clement Danes, in the County of Middlesex, by WILLIAM LITTLE, 198, Strand aforesaid.—SATURDAY, MAY 31, 1851.